

DIESEL PROGRESS

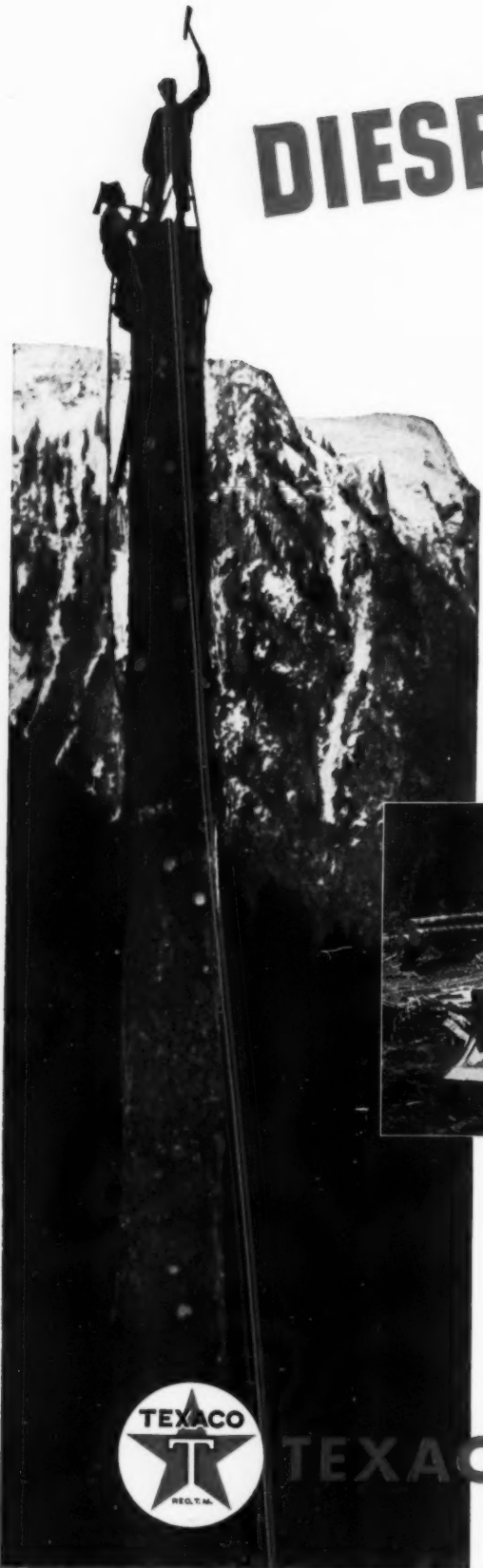
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NOVEMBER, 1943

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DIESEL *and* **GAS ENGINE PROGRESS**

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NEW STREAMLINE DIESEL TOW-BOAT

"HENRY S. STURGIS"



Above: Left to right: H. T. Pott, Pres. St. Louis Shipbuilding and Steel Co.; A. L. Long, Gen'l. Sup't. Ohio River Co.; A. R. Parsons, Chf. Engr. St. Louis Ship.; Chief Engineer Smith, of the "Henry S. Sturgis"; Edgar Meek, Capt'n. and E. M. Enslin, Secy. St. Louis Ship.

By A. R. PARSONS

ANOTHER "Streamliner" went into service when in mid-September the new twin screw Diesel towboat *Henry S. Sturgis* was put into operation by the Ohio River Company to help them in their wartime job of transporting coal and other essential bulk commodities to the defense plants in the Chicago area.

Designed and constructed by the St. Louis Shipbuilding and Steel Company, the *Sturgis*, named in honor of Henry S. Sturgis, Chairman of the

Board, West Virginia Coal and Coke Co., resembles in appearance the Diesel towboat *Sohioan* recently completed by the same company. On the *Sturgis* the streamlining has been carried farther than on the *Sohioan*, the forward line of the deckhouse presenting a sloping straight line without any step backs. This is also carried out in the cross-section of the deckhouse, having a straight line with some tumble-home from the main deck to the hurricane deck, with the only step-back coming at the pilot-

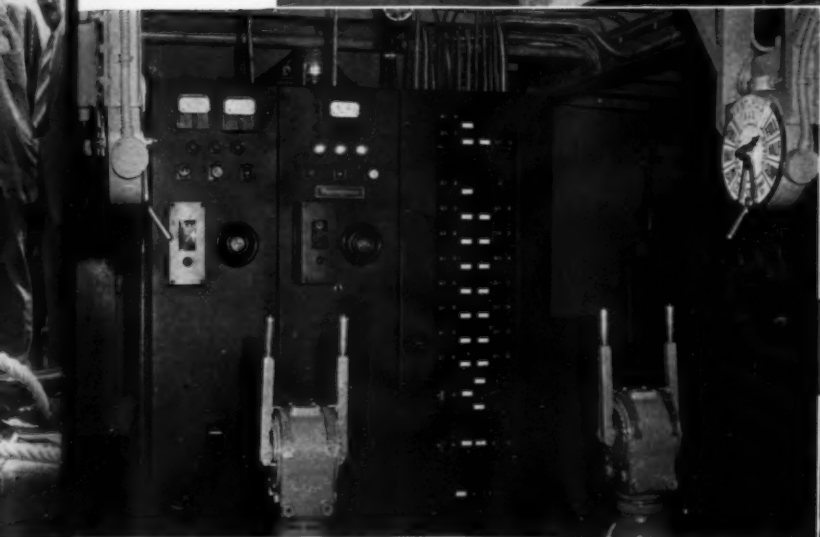
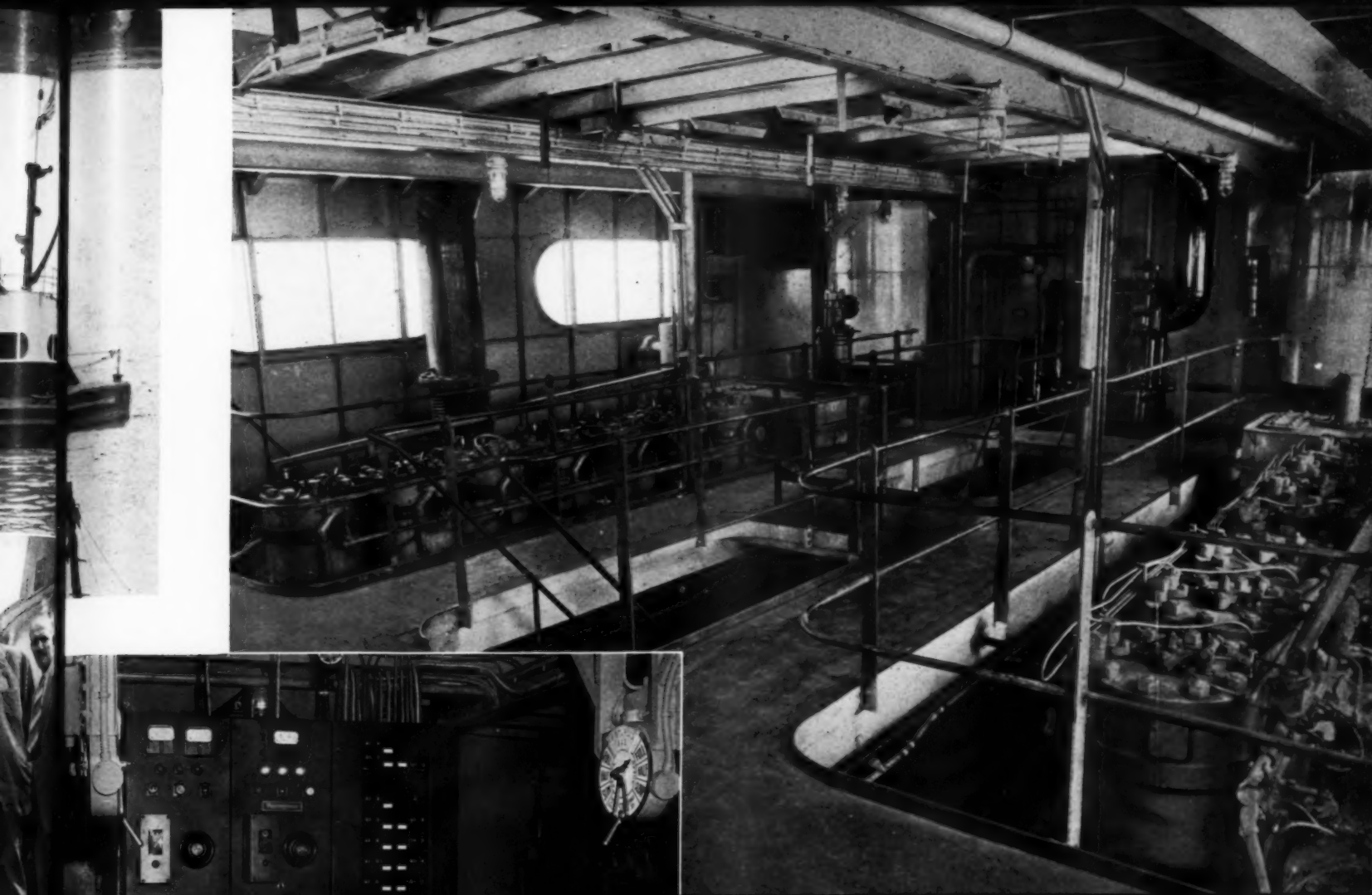
house, thus breaking an otherwise monotonous line but continuing the streamline effect. In keeping with the modern design of the hull and deck-house construction, all other features in connection with this new motor vessel were given much thought and consideration. The *Henry S. Sturgis* presents the combined experience of the St. Louis Shipbuilding & Steel Company and the river operating department of the Ohio River Company which operates such well known boats as the *W. W. Marting*, the *Omar*, and others.

The hull of the *Sturgis* is 154 ft. long, 36 ft. beam, 10 ft. deep with a draft of 6 ft. 6 inches.

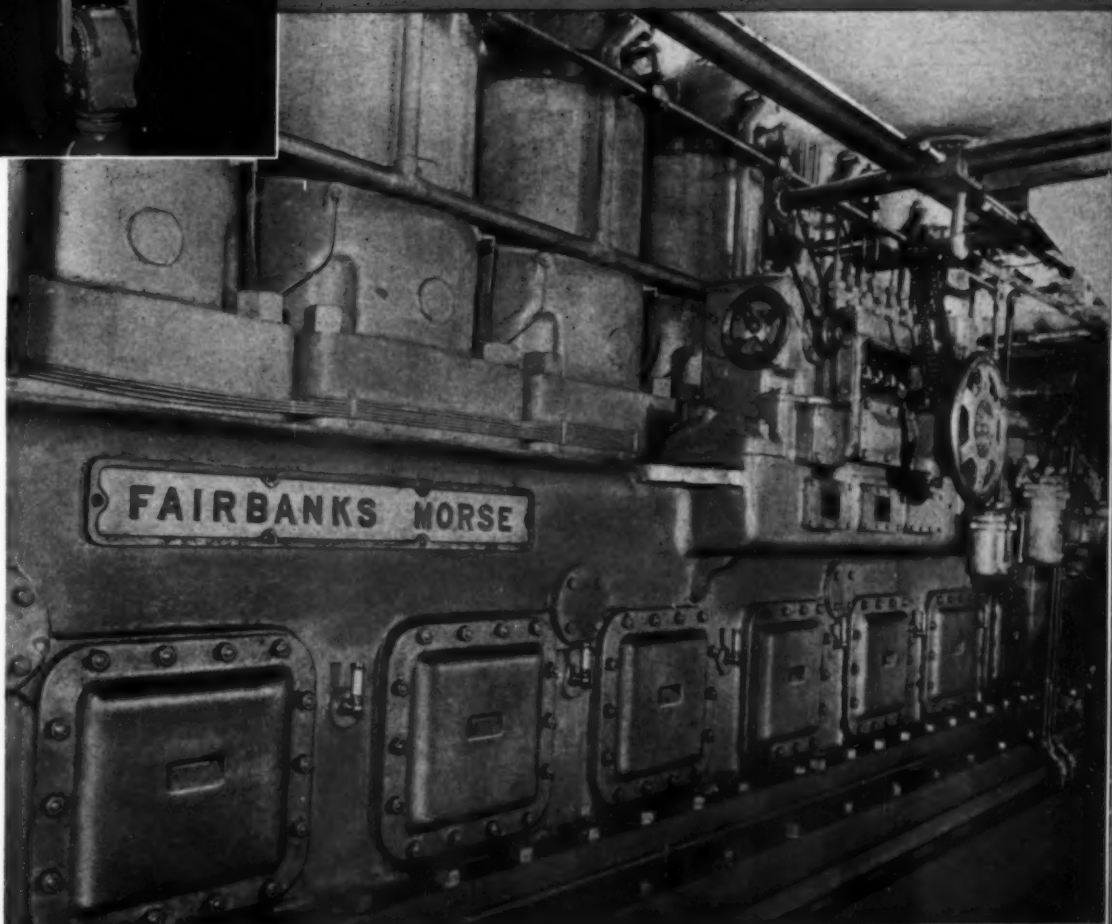
Upper room showing F-M main room and F-M Quarter main Fa

The bow is of the same design as the *St. Louis Shipbuilding* previous boats. The spacious engine room of the boat is of the engine

The *Sturgis* has two Fairbanks-Morse 14 in. bore 805 h.p. engines. The engine room is equipped with a 37 type emb



Upper right: Upper engine room view showing cylinder heads of the twin F-M main Diesels. Above: The engine room control station showing telegraph and F-M remote engine controls. Right: Quartering view of one of the two main Fairbanks-Morse 805 hp. Diesels.



The bow is the model-scow type, and the stern is of the same special design used by the St. Louis Shipbuilding & Steel Company on many previous boats designed and built by them. The spacious engine room is located near the stern of the boat with the quarters placed forward of the engine room.

The *Sturgis* has 1610 shp. and is powered by two Fairbanks-Morse 7 cylinder Diesel engines of 14 in. bore and 17 in. stroke, developing 805 hp. each at 300 rpm. Both engines are operated from a single one-man control stand in the engine room. The engines are of the Model 97 type embodying oil-cooled pistons, back-flow

scavenging with built-in scavenging pumps, open head combustion, differential injection nozzle, water-cooled exhaust manifold, and pressure lubrication. Each engine is of the direct reversing type, and each cylinder receives air for maneuvering, thereby eliminating any "dead spots" in starting and reversing.

The main engines are equipped with Maxim Silencers and American Air Filters on the air intake and Burgess Marine Snubbers on each of the exhausts.

The lube oil and soft water is circulated through each propulsion engine before starting and after shutting down by two before-and-after pumping units. Each of these units consists of a $7\frac{1}{2}$ hp. F-M motor with double-extended shaft, one end of which is connected to a Fairbanks-Morse water pump, and the other to a rotary lube oil circulating pump.

The main engines are equipped with built-in fuel oil transfer pumps taking the oil from the main fuel bunkers to overhead tanks, through Nugent fuel oil strainers. The oil moves from the day storage tanks through another set of Nugent filters to the built-in main engine injection pump reservoirs.

A modern and complete gauge board is provided in the upper engine room visible from the main engine control stand. On it are the lubricating oil, water and air pressure gauges, together with temperature gauges having high and low electrical contacts which sound an alarm in case of water or oil failure. Weston electric tachometers are mounted on the gauge board and also in the pilot house. Alnor Pyrometers are furnished for each engine and are mounted on the gauge board.

The lubricating oil coolers and the heat exchangers were furnished by the Ross Heater and Manufacturing Co., and the cooling system is piped with a tempering arrangement so that the cooling water from the generating sets can be used to warm the main engine jackets and thus facilitate starting in cold weather.

A Hilco Oil Reclaimer is installed in the after end of the engine room with a fixed overhead hopper to insure cleanliness in recharging. This hopper can be filled from the boiler deck, thereby eliminating the need for even carrying the filtering material through the engine room.

The *Henry S. Sturgis* is one of the few boats on the river having alternating electric current. Most of the river boats have direct current, mainly because of the use of arc searchlights

and Capstan controls. Here the electric power is furnished by two Fairbanks-Morse 8 cylinder 120 hp., 900 rpm. Diesel engines direct-connected to 100 kva. 80 kw. 80% power factor, 3 phase 60 cycle, 240 volt Fairbanks-Morse marine type generators.

Cutler-Hammer controllers are used for the majority of the motors including the a.c. motors on the capstans, and the direct current for the arc searchlights is furnished by a Fairbanks-Morse motor generator set consisting of a 15 hp. a.c. F-M motor and 10 kw. d.c. generator, which convert the 240 volt a.c. to 110 volt d.c. Most of the motors are 3 phase with some of the fractional horsepower motors connected to the lighting circuits which are single phase.

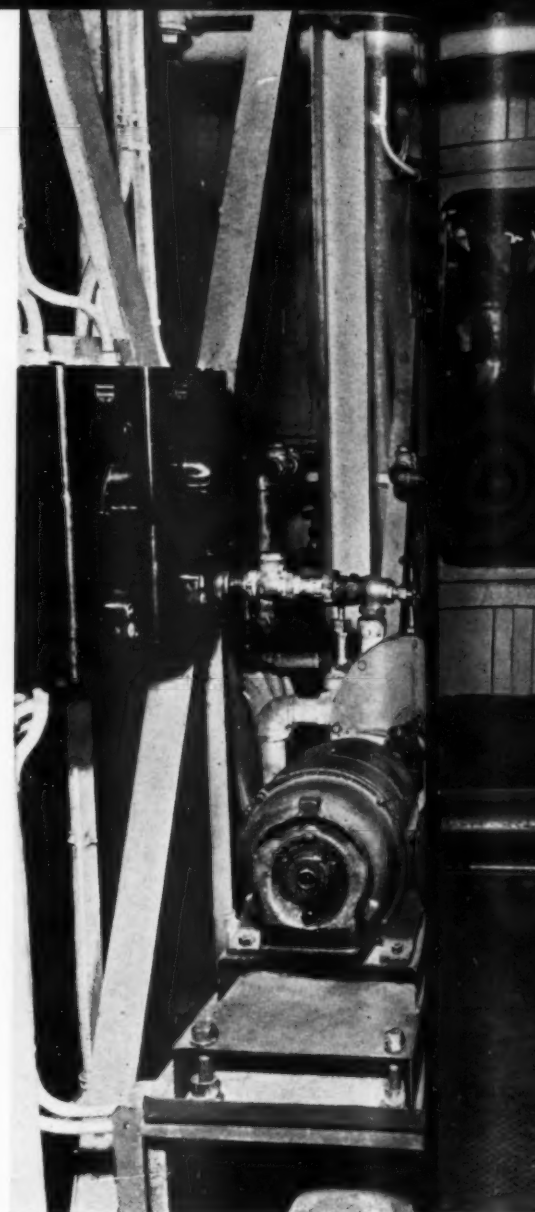
The switchboard is of the dead front, safety, circuit breaker type manufactured by the Westinghouse Electric & Mfg. Co., of St. Louis.

Engine starting air is supplied by Gardner-Denver compressors, two $4\frac{1}{2}$ x $1\frac{1}{8}$ x 4 single tandem 2-stage water-cooled machines being driven by the tail shafts of the main engines and one $5\frac{3}{4}$ x $2\frac{3}{4}$ x 5 vertical 2-stage duplex water-cooled air compressor being direct-connected to a 15 hp. 240 volt 60 cycle, 3 phase Fairbanks-Morse motor. The air tanks were furnished by Morrison Brothers. Two Carter self-priming centrifugal pumps are installed for use in the bilge and ballast system.

The stern tubes and stern strut bearings are lubricated by means of a Lincoln Engineering Company automatic lubrication system, using a pressure system with a measured amount of lubricant admitted to the bearings for a predetermined number of revolutions of each of the tail shafts.

The boat has independent electric automatic Fairbanks-Morse pressure systems for the drinking, wash and sanitary water, and the exhaust pipes of the generating sets are jacketed to supply hot water. The heating system for the quarters and pilot house is of the hot water, forced circulation type. The complete system of boiler, oil burner, and radiators was furnished by the Crane Company.

The quarters, especially on the second deck, are larger than on the average towboat due to the streamlined construction of the deck house. The boat has accommodations for a crew of 19 men plus a spare room and a guest cabin. The *Sturgis* has a separate mess-room for the officers and crew. Separate lounges, attractively furnished and equipped with a Philco cabinet type radio are also provided. Passage ways, lounges



Modern towboat design permits convenient arrangement of auxiliaries. Seen here are F-M before and after water and lube pumps, left, and Ross heat exchangers, right.

and mess rooms are covered with Armstrong lino-tile. Walls are insulated with fiberglass and the ceiling of the engine room is sound proofed with fireproof acoustic panels. Special attention has thus been paid to the comfort of both the crew and officers.

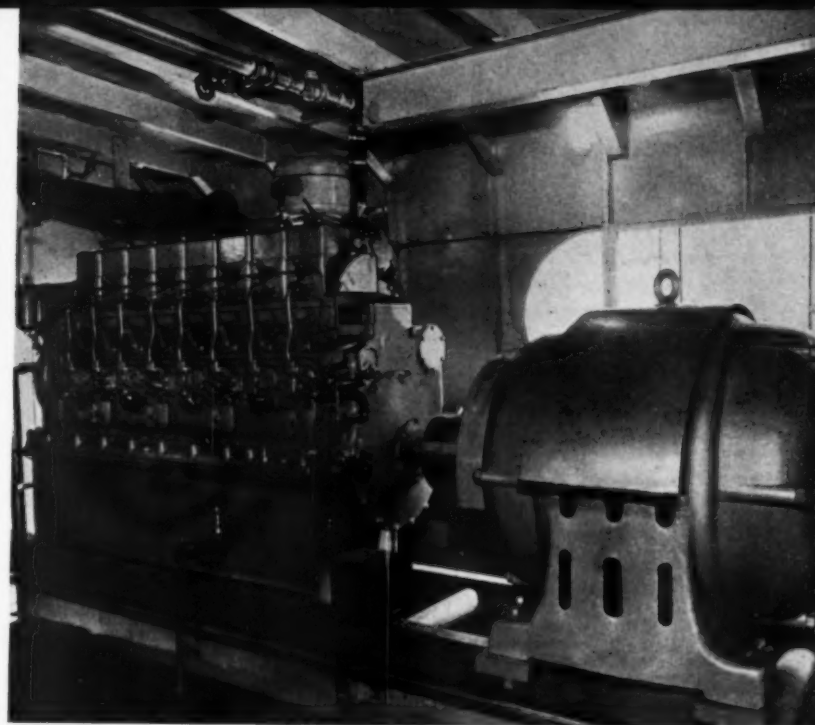
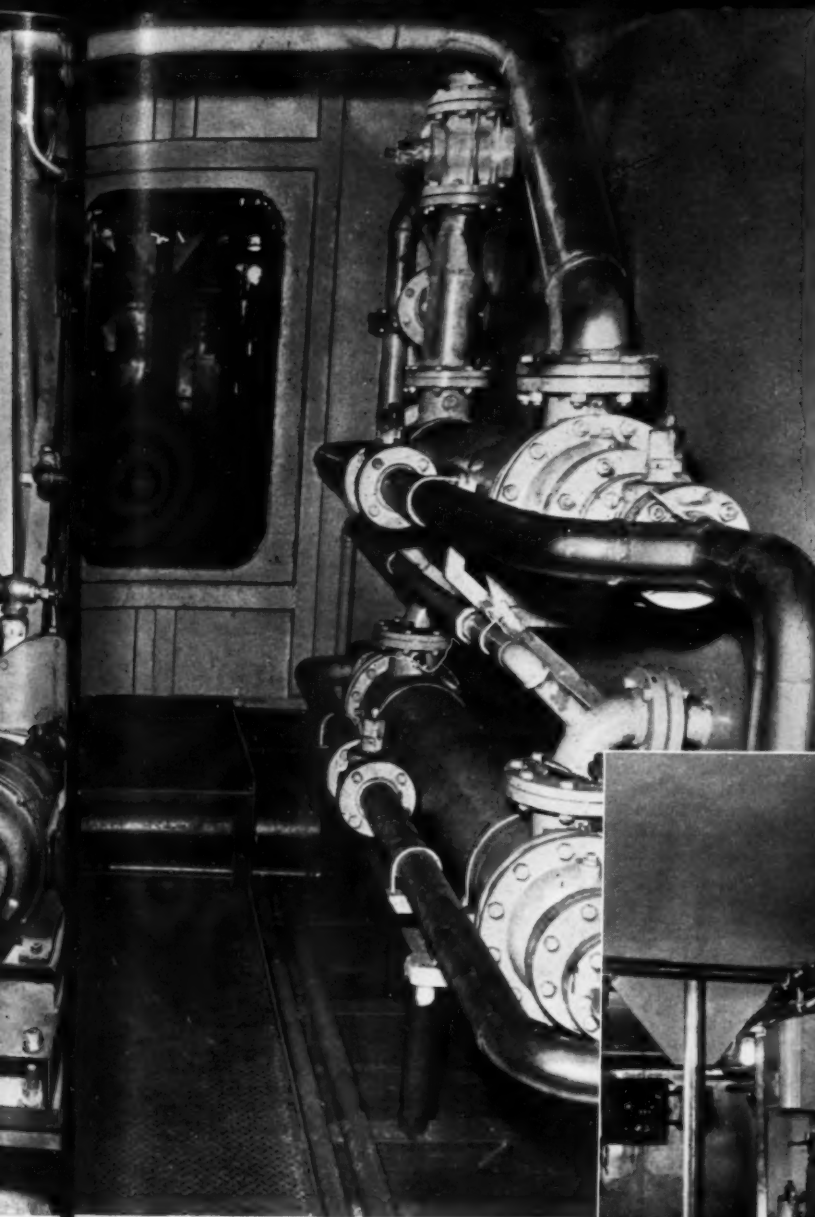
The galley is completely equipped with spacious cupboards, an 83 foot Frederick refrigerator, a George Lytle Quick-Freeze box. And an "Electricmaster" electric range.

An American Electric Company telephone system is installed connecting the pilot house, the

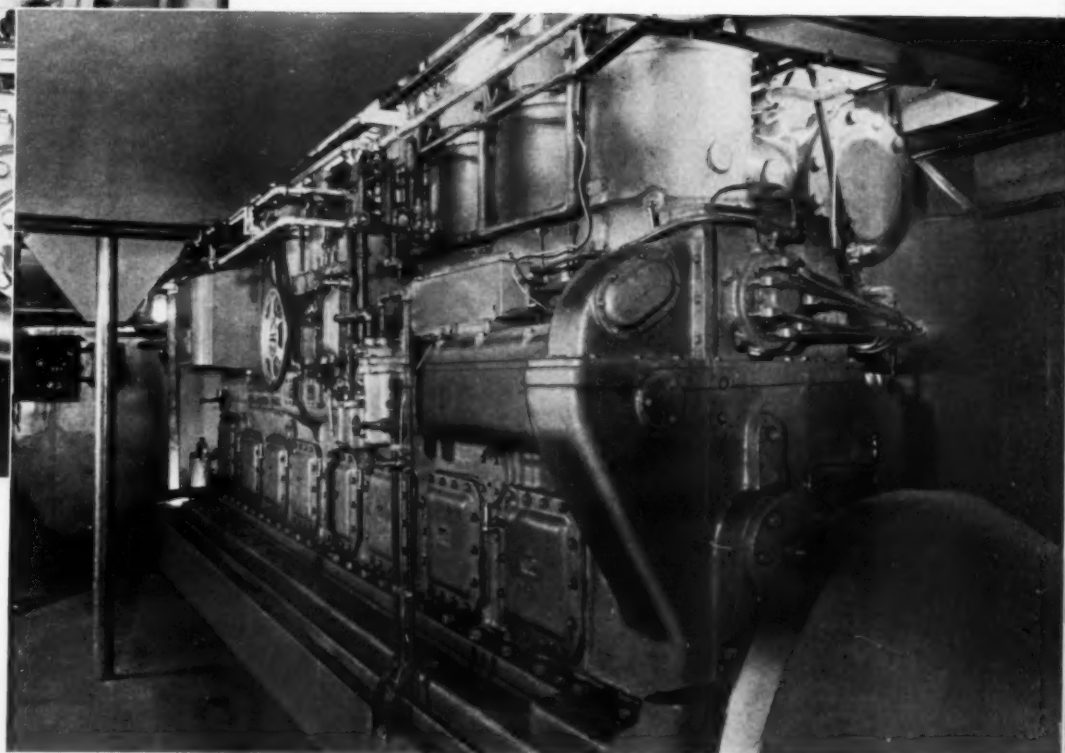
engine-room, room and crew

The steering ing & Steel C type with a designed and River Comp levers in the of the rudd type of rudd

The engine r tric type. W



Upper right: One of two F-M 120 hp. Diesels and generators which supply current for ships services. Right: Operating side of one of the two F-M propulsion Diesels.



engine-room, Captain's room, chief engineers room and crew's lounge.

The steering gear is of the St. Louis Shipbuilding & Steel Company standard electro-hydraulic type with a special electric type of follow-up designed and furnished by the owner, the Ohio River Company. The position of the steering levers in the pilot house indicates the position of the rudders, and, in addition, an electric type of rudder indicator is provided.

The engine telegraph system is also of the electric type. When the pilot changes his signaling

lever in the pilot house, this operates a light and rings a bell in the engine room until the engineer moves his reply lever to a position corresponding to the pilot's signal. The *Sturgis* is equipped with four Schoellhorn Albrecht Capstans all driven by 10 hp. Fairbanks-Morse motors. Two are located on the forward deck and one mid ship on each side. A hoist manufactured by Beebe Bros. is located at the stern.

The boat has two Carlisle-Finch 19-inch Arc Searchlights and a Kahlenberg Triplex Air horn with a whistle light to indicate when the horn circuit is closed.

Similar to the *Celeste*, the *Glenn Traer*, and the *Sohioan*, the *Henry S. Sturgis* has the main engines located near the aft end of the boat thus shortening the length of the shafting and reducing the noise in the quarters. The steady line shaft bearings are furnished by the Medart Co., while the bronze stern tube and stern strut bearings were supplied by the owner. The propellers are of cast steel, three blades and are of the St. Louis Shipbuilding & Steel Company standard blade design and manufacture. From bow to stern the *Henry S. Sturgis*, streamlined to the greatest degree, is a thing of beauty and practicability.

DIESELS SUPPORT LOWEST RATES IN INDIANA

By WILLIAM H. GOTTlieb

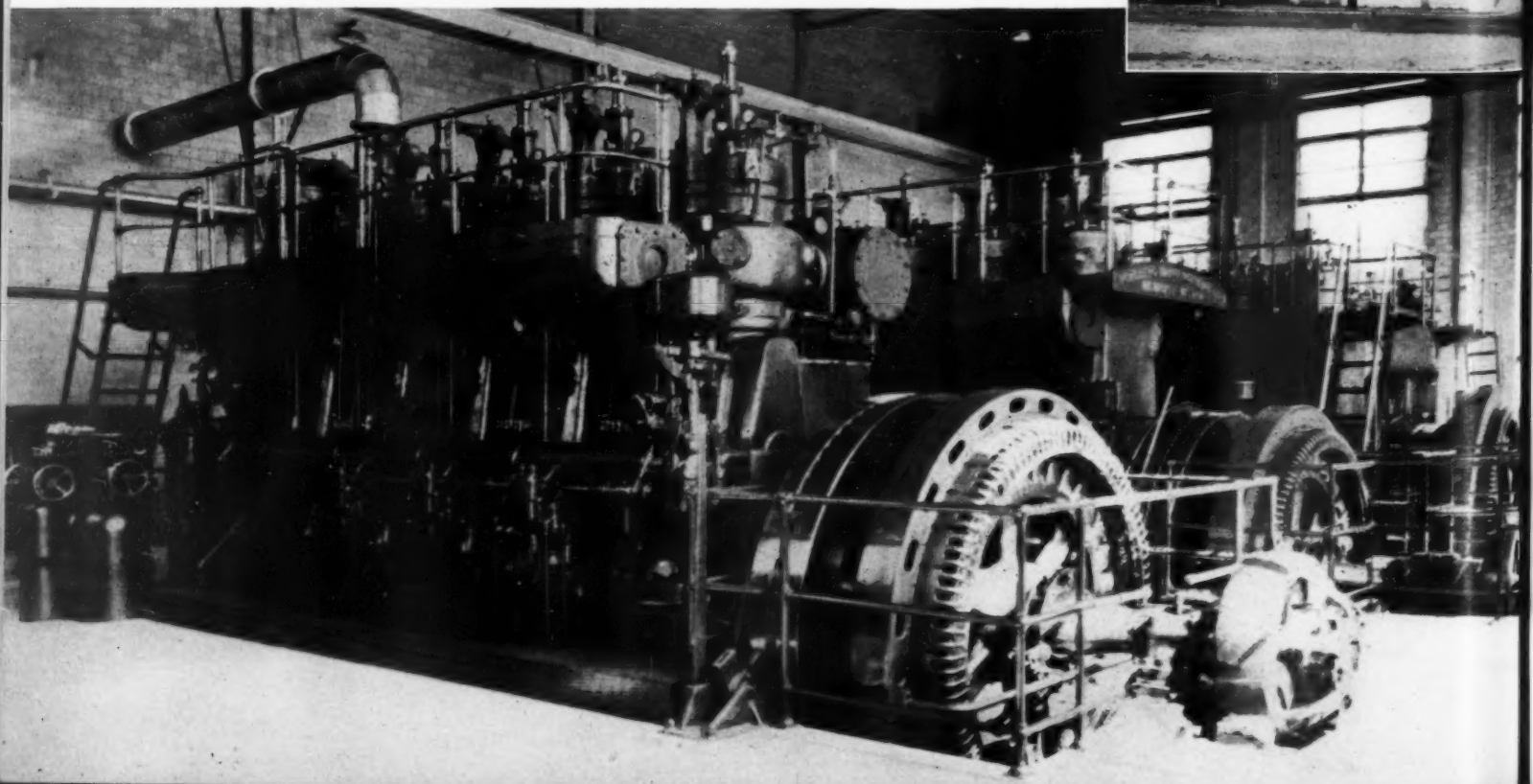
THE major function of a municipal power plant is to supply dependable electric service at low cost and, judged on this sound basis, the 4350-hp. Diesel plant at Rensselaer, Indiana, is the most successful plant in the state. Residential consumers in this community of 3,200 population pay just 3.6 cents per kilowatt hour for the first 50 consumed in a month and 1.8 cents for each kw.hr. over 50. The Federal Power Commission in its 1941 report comparing rates for 25 kw.hrs., 100 kw.hrs. and 250 kw.hrs., found Rensselaer lowest in all three brackets among Indiana cities between 2500 and 10,000 population, and lowest in the 100 and 250 kw.hrs. brackets among all cities in the state, regardless of population.

The achievement of this leadership was dependent upon three factors: low cost of power production, progressive rate policy and development of consumption volume. The three factors are themselves interdependent and the foundation of all is production economy. When Rensselaer installed its first Nordberg Diesel in 1925, a 550-hp., air-injection engine direct-connected to a 375 kw. General Electric generator, the consumer was paying a flat rate of

8 cents a kilowatt hour, as low a rate as the existing steam plant could support. Total production for 1926, the first full year of Diesel operation, was 1,137,700 kw.hrs. Rate reductions and expanding consumption kept pace with the growth of the Diesel plant. In 1928, the city installed an 875-hp., air-injection Nordberg direct-connected to a 600 kw. G.E. generator, and in 1933 a 1425-hp. Nordberg of the same type with a direct-connected 1000 kw. G.E. generator. The latest addition to the plant, installed in 1940, is a 1500-hp., mechanical-injection Nordberg Diesel driving directly a 1000 kw. G.E. generator. From the first the Diesels demonstrated cost superiority and the steam unit served only as a standby. Steam was removed in 1933 so that today Rensselaer has a 4350-hp. all-Diesel power plant. In 1941, plant production was 4,692,500 kw.hrs., more than 400 per cent above the first Diesel year. In 15 years of Diesel operation, the plant has generated more than 35,000,000 kilowatt hours.

This vast expansion in production was made possible by constant encouragement of domestic consumption, the mainstay of the Rensselaer power system. Aided by low rates and a promo-

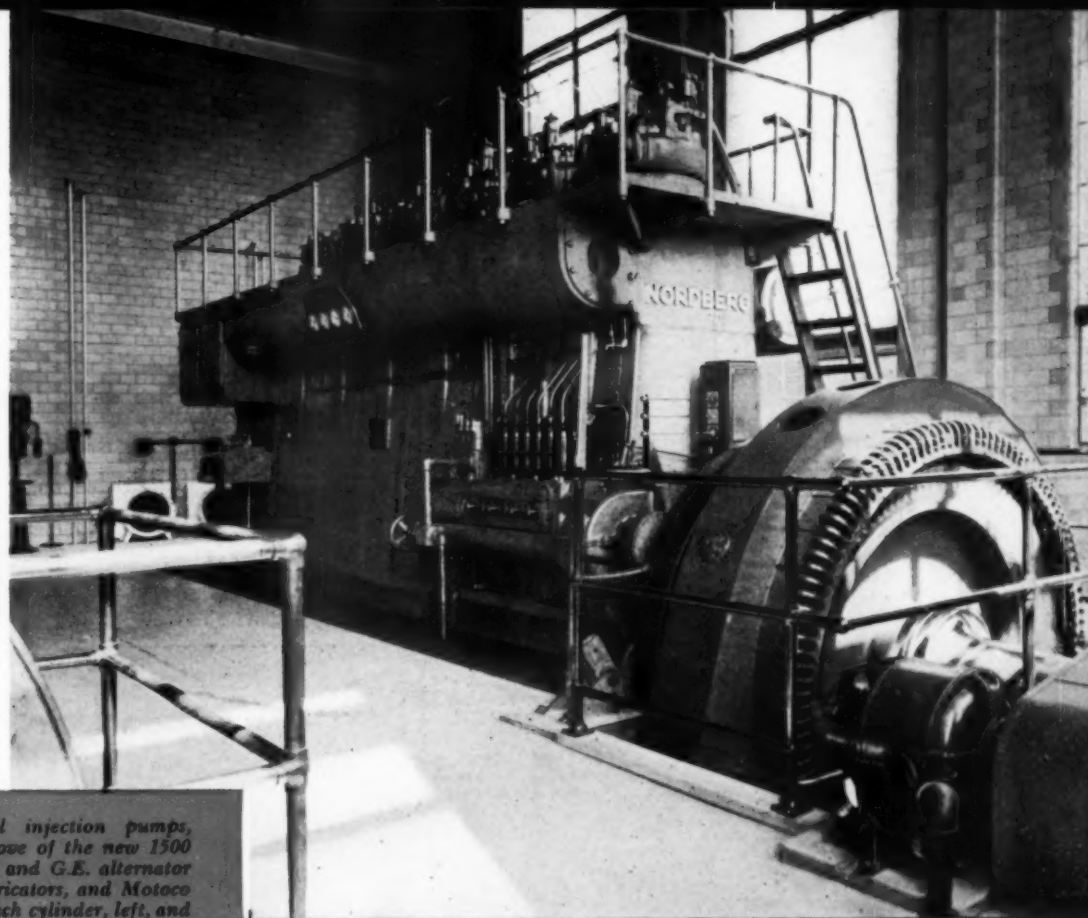
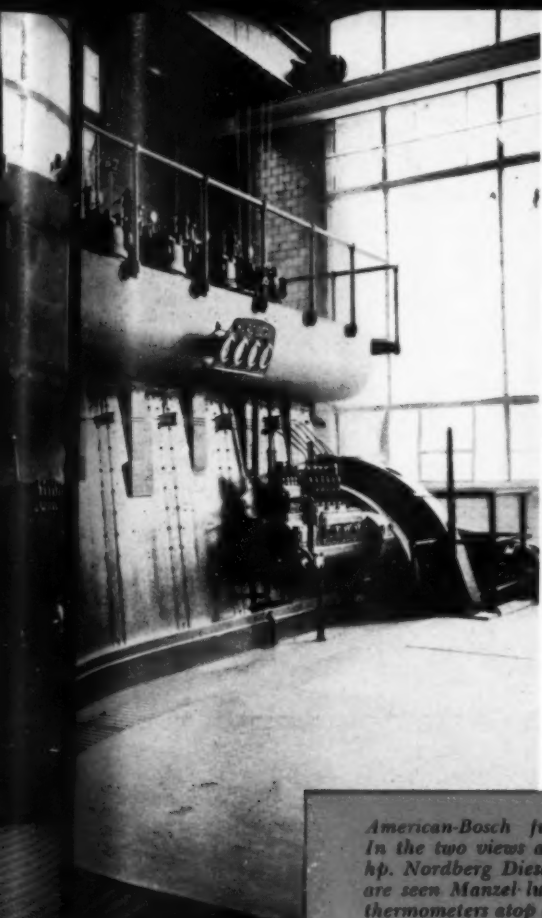
General engine room view showing the four Nordberg Diesels and G.E. generators totalling 4350 hp.



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American-Bosch fuel injection pumps, in the two views above of the new 1500 hp. Nordberg Diesel and G.E. alternator are seen Manzel-lubricators, and Motoco thermometers atop each cylinder, left, and right.



Exterior view of the Rensselaer, Indiana municipal power plant.

tion campaign, the city attained an unusually high use of electric appliances. In 1942, of the 960 residential customers, 760 had electric refrigerators, 424 had electric stoves, and 88 had electric water heaters. Only the halt of appliance manufacture, forced by the war, has stopped the further electrification of Rensselaer homes.

With an operating revenue of less than \$.0213 per kw.hr. generated, low cost power produc-

tion is a necessity and the Diesels have provided the requisite economy. In 1941, plant operating costs were as follows:

Fuel	\$22,883.46
Lubricating Oil	1,306.58
Labor	8,878.23
Maintenance	1,877.32
Supplies & Miscellaneous	2,809.58

Total\$37,728.90

With 4,692,500 kw.hrs. generated, this meant a production cost of \$.00804 per kw.hr. Including plant operation, distribution, depreciation and general expenses of the electric department, the cost per kw.hr. was \$.01482, leaving a net operating profit of \$.00646 per kw.hr. Here is the complete, itemized financial picture of the year's operations:

Income

Residential	\$37,006.74
Commercial Lighting	29,344.16
Municipal Contract	6,167.37
Commercial Power & Heat	19,450.49
Sale to other Utilities	11,968.00
Water	3,090.78
Rural and Miscellaneous	1,189.56
Total	\$108,217.10

Less

Cash Discounts	\$8,273.79
Bad Debts	30.59

Total 8,304.38

Operating Income \$99,912.72

Expenses

Power Plant Operation	\$37,728.90
Distribution	5,283.41
General	8,177.74

Total Operating Expense \$51,190.05

Depreciation 18,336.00

Operating Expense plus

Depreciation	\$69,526.05
Net Operating Revenue	\$30,386.67
Non-Operating Income	1,284.95

Total Net Profit\$31,671.62

Superintendent Louis C. Ramp rounds out the picture with the information that this has been a dependable plant. Rensselaer's lights never have been darkened by a Diesel engine failure.

The 1500-hp. engine already has run 10,000 hours without a repair of any kind. Convenience of operating and engine durability are inherent in plant design. The Diesels are of heavy-duty design and accessory equipment is arranged to insure purity of fuel, lube, air and water.

The closed cooling water system permits only soft water to enter the engine jackets. A motor-driven centrifugal pump for each engine draws jacket water from a common hot well, pumps it into a pressure header from which it flows through a shell-and-tube heat exchanger, then through the engine and back to the hot well. A thermostatic valve automatically keeps the water entering the engine at the desired temperature by bypassing a varying quantity around the heat exchanger. A second motor-driven centrifugal pump for each engine circulates raw water through an oil cooler, the heat exchanger and over two atmospheric-type cooling towers. Actually there is no "raw" water, for all water used in either circuit is treated in a large-capacity softener. As a safety measure, provision was made for circulation of water under city pressure through the engines and oil cooler circuits.

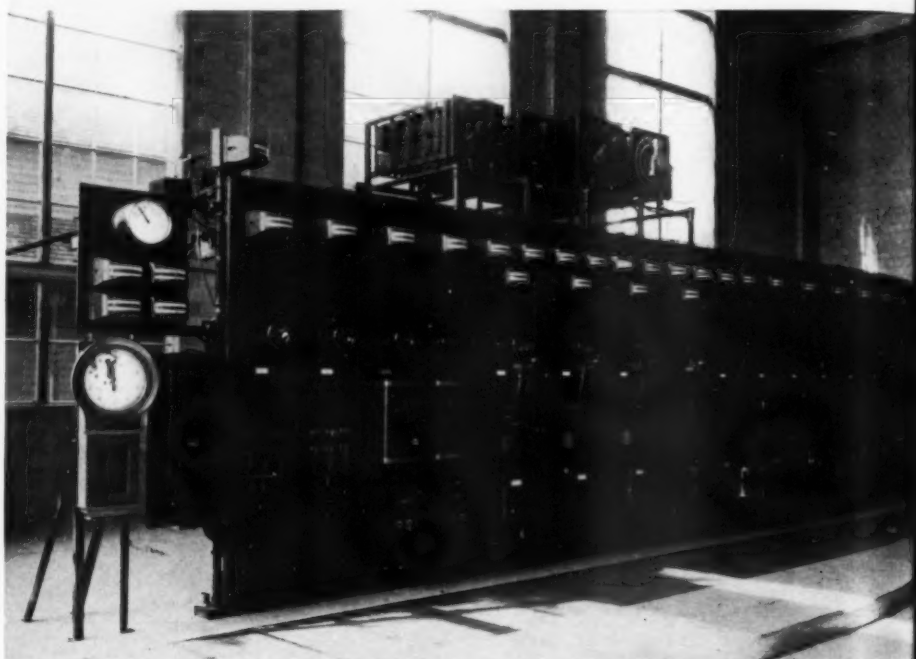
Lubricating oil for each engine is circulated to the bearings under pressure by a built-in pump. This circuit includes an oil cooler. An activated-clay purifier, in continuous operation, cleans lube oil for the 1500-hp. Diesel, taking oil from the engine sump and returning purified oil to the sump. Lube is drained from the other engines periodically and reclaimed in a clay batch purifier. Each engine is equipped with a motor-driven auxiliary lube pump which serves both as standby and as a before-and-after pump. In the case of the new engine, this pump is controlled automatically by a pressure switch which starts the auxiliary pump when engine lube pressure drops below a predetermined point. Cylinders are supplied with lubricating oil by force-feed mechanical lubricators. An alarm system summons the operator if either lube or water pressure drops.

The plant is equipped for delivery of fuel either by rail or truck, with two 24,000 gal. horizontal storage tanks above ground near the plant and a 90,000 gal. vertical tank near the railroad tracks six blocks away. There is a small pump house at the railroad with a motor-driven rotary pump for unloading and transfer. At the plant, a similar pump is used for truck unloading and to transfer fuel from storage to an elevated supply tank in a storeroom adjacent to the engine room. The fuel then flows by gravity through individual meters to the day tanks in the basement from which the engine pumps draw their supply. There is a duplex, bag-type filter between day tank and engine. Air for all the engines enters an air-house through a stack and passes through 12-element impingement-type filters for the two larger engines, and smaller batteries of filters for the

smaller engines. Operator convenience is served by a gauge board on each engine with pressure gauges for fuel, before and after filter, starting air, water, and lube, before and after cooler. Also on the engine is a set of dial-type thermometers, and near at hand is an exhaust pyrometer. The well-equipped 16-panel switchboard holds voltage regulators, totalizing kilowatt-hour meters, ammeters, kilowatt meters, power factor meters, wattmeters, synchronizer, master clock, and inverse time limit overcurrent relays.

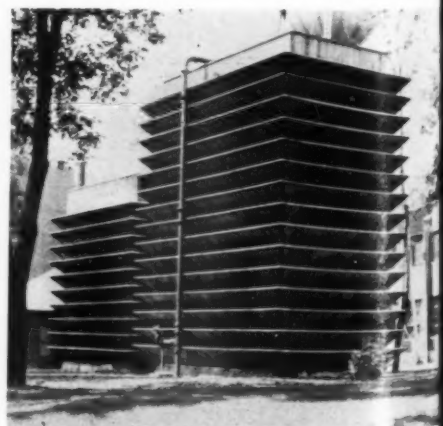
The striking figures on the Rensselaer muni-

Koerting oil coolers and Manzel cylinder lubricators. Cooling system equipment includes Schubert-Christy cooling towers, Sims heat exchangers, American Well Works pumps, Samco thermostatic valves, and a Zeolite softener. The air filters are American, the exhaust snubbers Burgess, thermometers Motoco, gauges U. S. Gauge, the pyrometer Alnor, the pressure switches are Minneapolis-Honeywell, the motion crane is Shaw, and the switchboard and switchboard instruments are General Electric. The fuel is supplied by the Advance Oil Co. Texaco Ursa P 40 lubricating oil is used for the cylinders and Texaco Algol for the bearings.



The switchboard is GE made and equipped.

Schubert Christy towers for cooling the raw water.



cipal power plant tell of more than 125,000 engine hours of service, more than 35,000,000 kilowatt hours produced, power production at 8 mills a kilowatt hour. But the important fact is that Rensselaer citizens enjoy the lowest rates in the state. That is why they invested in Diesel prime movers.

Accessory equipment of the Rensselaer plant include Woodward governors, Bosch fuel injection pumps, Viking fuel transfer pumps, National and Bowser meters, Nugent fuel filters, a Honan-Crane continuous lube purifier, a Youngstown-Miller batch purifier, Schutte and

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SEES END OF

“IRON HORSE”

AN old familiar institution will some day be only a memory. The steam switching locomotive, the great puffing behemoth whose friendly sinew has inspired so many boys to become its master at the throttle, is obsolete.

No more new ones will be constructed for American railroads. This prophecy was recently made by B. B. Williams, president of The Cooper-Bessemer Corporation, who said the lovable giant's place is rapidly being taken by an unromantic midget not much larger than the steam locomotive's tender.

The midget, run by Diesel motive power, is being turned out in large numbers to meet the increasing demands of American railroads and industry which have a tremendous volume of war materials to handle.

"The old steam switching locomotive is gone," Mr. Williams said. "Of course, the ones now in use will be rebuilt and repaired until they are run to the thin end. But no new ones will be constructed." The chief reason for the old friend's demise is its failure to develop enough power from a dead stop. After it gets up enough speed, it is powerful enough but, in getting up speed, much effectiveness is then lost. One Diesel locomotive builder recently hitched a big steam switch engine to a train of fifty cars, which had been left on a siding long enough for the bearings to become stiff. The big steam locomotive groaned and puffed until its wheels skidded on the tracks, but it could not pull the train. Then a tiny Diesel-driven locomotive was applied. With the first pull of the throttle, it walked away with its load. "Industries and railroads want flexibility from

their switch engines," Mr. Williams said. "Speed is secondary in importance."

In another recent contest between a Diesel locomotive and a steam switch engine, the steam engine was hitched to a train of cars loaded with slag to be dumped on a slag pile at a big steel mill. The steam engine took the train half way up the incline and was then stopped. When the throttle was pulled out again, it could not continue its journey. It had to be backed down to get up enough momentum to carry it to the top of the pile. Then the midget Diesel, with only a fraction of the steam locomotive's power, was attached to the slag cars at the bottom of the grade. When it got half way up the incline it, too, was stopped. But when the throttle was pulled out, it continued its journey apparently without effort.

DIESELS HARVEST TREES FOR AIRPLANES-AND TOOTHPICKS

By JIM MEDFORD

EVER see an airplane under construction? Ever stop and examine a hundred-foot-plus tree? And that toothpick you so casually reach for after a rationed dinner—there's a relationship between them all. And there's a story behind them. A truly big and interesting story of a new old industry.

It begins with a 100 hp. Diesel Caterpillar tractor, one of the big yellow ones you see everywhere. It's part of the estimated 5,000 track-layers clawing around in steep forests of Northern California and the Pacific Northwest. The driver we'll call Mike, just to give him a handle.

He's typical of the thousands of the gentry that bat the cats around through the timber—narrow hipped, flat bellied; the brand of the range on many of them and used to bucking behind their Levis. They need that extra something because they take more chances for no medals than the busiest tank driver in a desert charge. And if you're privileged to ride with Mike, it's positive you must grab yourself a piece of solid something. Because the cat will spin on that penny that looks like a dime, climb over a downfall, clamber over a batch of boulders and side-wind up to a piece of timber that has makings for a war worker's dwelling, or maybe seven million toothpicks.

Some distance away from the prospective load, Mike puts the brakes on one tread, the cat spins, and the twenty-foot high steel arch tied on behind lurches on its track treads, weaving its way up, up to the prone tree sections. Chokers cinched around the ends of one to four logs, or more, are hooked onto the steel cable led through the arch block from the winch on the rear of the cat. At the high sign from the 'jack on the ground, Mike feeds the power from the Diesel to the drum. Muttering, it takes in the slack, the log ends clear. Mike does this and that with hands and feet and the cat roars down the mountain side's 45 degree slant to cold deck at the mill or shipping point.

You can't fight wars without wood. Hundreds of wooden ships are being built. More are going to be built. And things like barracks, bridges, war industry housing—yes, even planes that once were growing things in this north

woods are again living things that are helping to win the war.

Coming out of California and Oregon and Washington and Idaho are more than two and a half billion feet of the finest lumber that grows. It comes into existence at the rate of a thousand feet of timber per acre, on the west slopes where over twenty million acres of marketable timber are growing. And it produces the material that wears out over 300,000 suits of overalls on as many wood-working mechanics per year.

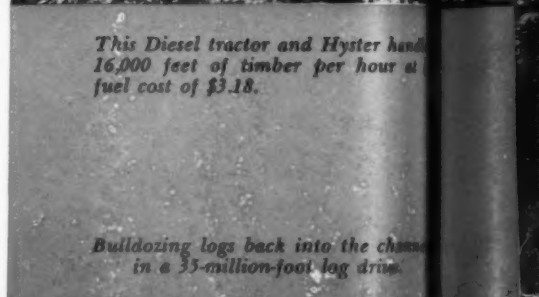
The \$10,000 cat and logging arch have revolutionized the logging business. This rig that set Paul Bunyon and Babe, the big blue ox of legendary north woods fame back on their haunches as spectral spectators, does the impossible so common today in industry. It goes where nothing else can or will, and it does it with a minimum of effort and cost. It makes possible planned logging and acts as forest conservation by logging where the best stands are and sparing lesser growths which formerly were worked because close in. And when its dozer is down, it builds its own road going in to lope over coming back with its tail in the air and the makings of an airplane tied thereto. Airplanes alone need 45,000,000 feet of spruce.

In addition to California's redwood and the Northwest's pine, hemlock and fir, there's spruce, the demand for which has never been equalled. And it has a habit of picking a range that is hard to reach. The cat and arch have handled this, too, as they have the more commonly found types of timber. But spruce is different in that it does not go on living and growing old gracefully like the more plebian trees. No, it deteriorates once ripe, rotting as it stands. The forest must be given the attention Americans give their Victory Gardens—surplus cleared out, pruned and given space to grow, to develop.

And, so, along the High Sierras, and the Coast Range and other ranges the Diesel cats roar their defiance to the rock ramparts and go swaggering along with their weird high arches to keep the mountain jackstraws coming to the factories to be turned into airplanes—or toothpicks—that a nation may survive.



This Diesel tractor and Hyster handle 16,000 feet of timber per hour at fuel cost of \$3.18.



Bulldozing logs back into the channel in a 35-million-foot log drive.





Skidding logs a quarter mile to landing this outfit handles 40,000 feet per hour.

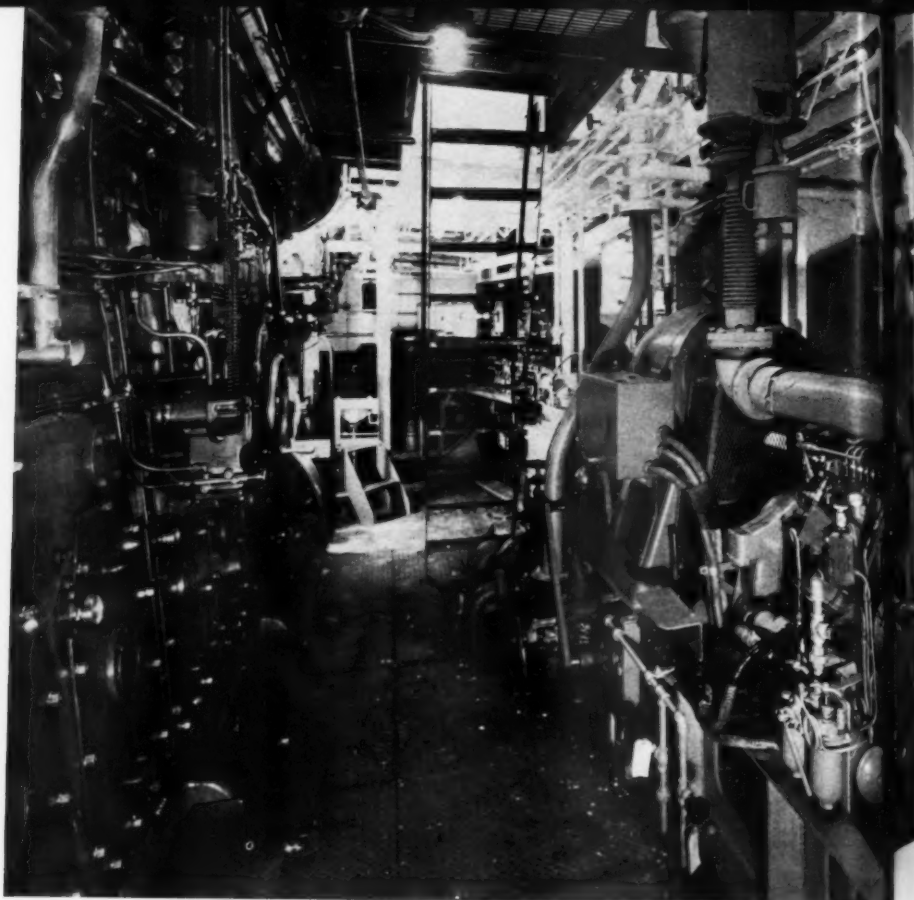
Left: Starting a 1000 ft. haul over rough terrain with 4000 ft. of timber.

End of a 1 1/4 mile haul with loads averaging 6,300 feet of timber. These 3 Diesel tractors bring in 110,000 feet of timber per 8 hour day.





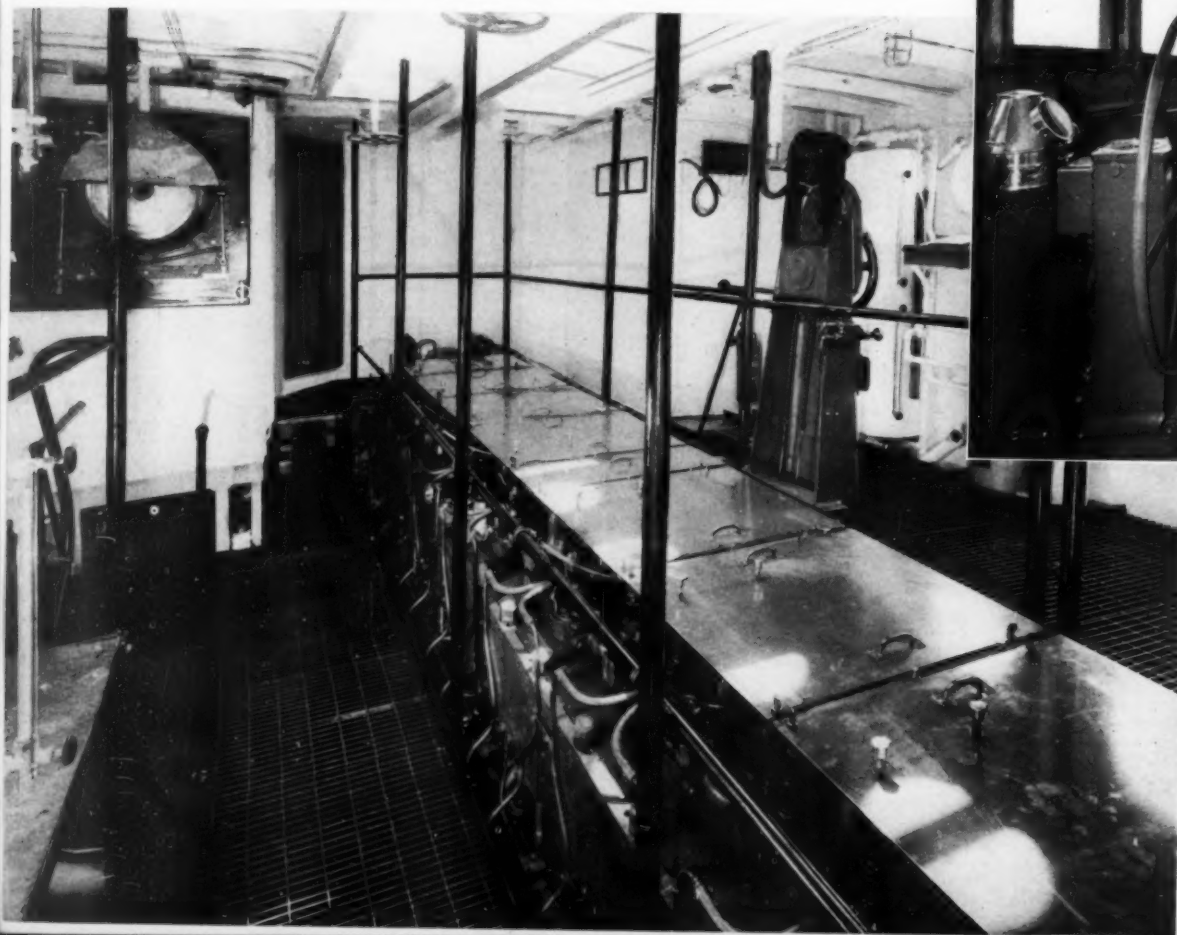
View looking forward, front to rear: The switchboard, Hilco lube reclaimer and Gardner Denver compressor.



Rathbun, 1025 hp. main Diesel, left, and Reiner, Hercules Diesel engined auxiliary unit, right.

By DWIGHT ROBISON

View in the upper grating showing heads of the main Diesel and remote engine control, upper right.



In this view of the wheel house are seen the Bludworth direction finder and R.C.A. radio telephone.

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"Oiltransco" on trial run in Long Island Sound.

SMART NEW DIESEL LAKE AND CANAL TUG

THE very much up-to-date 95 foot, all steel Diesel tug *Oiltransco* which recently went into the service of the Oil Transfer Corporation, New York, is of more than passing interest. She is specially designed by George B. Drake, Naval Architect, New York, for Lake and Canal work and will bring oil-laden barges from the Middle West through the Great Lakes to the East and distribute them coastwise. Thus *Oiltransco* becomes another vital supplement to our over-taxed rail and pipe line systems in the battle against winter blasts in the oil-rationed East as well as Hitler's undersea wolves.

Jakobson Shipyard, Inc. built the *Oiltransco* with its usual thoroughness and competence in the midst of war-time priorities while satisfying the demands of the Navy in the construction of more vital craft. Even her big Rathbun Diesel had to be built piece-meal, so-to-speak, between higher priority jobs for the Army. Such are the conditions imposed by war and such are the results of American ingenuity and enterprise. *Oiltransco* is built "close to the road" having a clearance height of 15½ ft., which gives her an unusually compact and sturdy appearance as compared with harbor and sea-going types. The squat deckhouse provides space for wheelhouse, quarters for licensed men, toilet facilities, galley and mess. Quarters for unlicensed crew are in

the foc's'l. All parts of the tug interior are accessible without going on deck—a feature which characterizes many tugs of the Oil Transfer Corp. fleet. She measures 95 ft. overall length, 24 ft. beam, and 12 ft., 3 in. depth.

The main engine is a Rathbun, 8-cylinder, 16 x 24 in., direct reversible marine Diesel rated 1025 hp. at 277 rpm.—a power plant of considerable output for a tug of this size. This slow speed, heavy duty engine is direct connected to the single propeller. A Star, 15 kw. generator, V-belted to the tail shaft, supplies normal electrical requirements while the main engine is operating. A Reiner auxiliary unit comprised of a Hercules, 70 hp. Diesel, 25 kw., 1200 rpm. generator, Gardner Denver, 65 cfm. duplex compressor and 230 gpm. bronze fire pump is provided. An Exide 56 cell, 300 ampere-hour battery floats on the line.

Operating accessories for the main engine include a Sentinel fuel oil filter, Viking fuel oil pump, Condenser Service and Engineering lube oil cooler, Brown pyrometer and a Hilco lube oil reclaiming. Engine rpm. ahead and astern are shown by Weston tachometer dials on the main engine itself, also in the upper grating and in the wheelhouse. The closed, fresh water engine cooling system is fitted with a Condenser Service

and Engineering heat exchanger, Wienman circulating pumps, and Elliott sea water strainer.

That her auxiliary machinery has been coordinated with the slow speed, heavy duty main Diesel for long, continuous hauls is attested by the installation of motor-driven bilge, ballast and emergency sea water pumps, also oil and circulating water pumps, in duplicate, all of full capacity. A duplicate shaft driven Gardner Denver air compressor is also provided. The switchboard, built to the owner's design, carries a Safety Car Heating voltage regulator.

In the wheelhouse are Bludworth direction finder and R.C.A. two-way radio telephone. Fitted on the after deck is a Silent Hoist electric capstan. Principal items of galley equipment are Web Perfection oil burning range and a Kelvinator refrigerator of 75 cu. ft. capacity built to the owner's specifications.

Oiltransco is an A-1 class, American Bureau-approved tug for Great Lakes and coastwise operation. This brief review of her essential equipment and a look at the accompanying illustrations indicate that she will stand up well to the pressure of war-time movements and still be available for a long period of profitable peace-time activity.

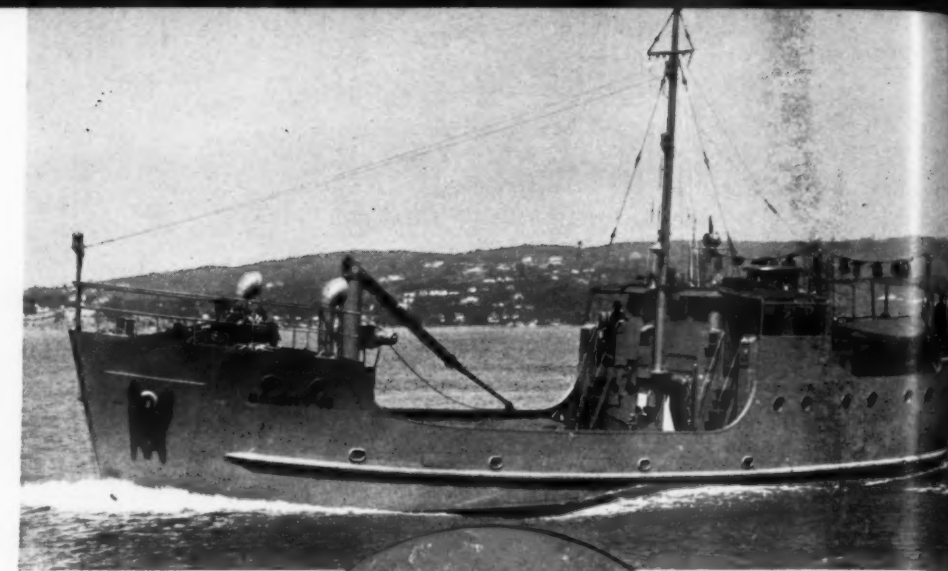
SOME say they are the Postwar dream of a small, compact Coastal Freighter type for general utility "Marine Trucking" duty in remote outports and inter-island pickup and delivery. Some say the quantity and minute detail of the elaborate equipment layout for efficient operation, rapid cargo handling and crew comfort, should be incorporated into a hull of about 125 x 25 x 10 ft. size, instead of a 100 ton freighter only 99 ft. long. Others say they are a nightmare design evolved by freshwater river navigators in the Army Engineers Office in Cincinnati, wherein they tried to do too much on a too restricted basis for practical operation. Perhaps more length would give these vessels greater speed.

But everybody agrees that the *F-48*, first of a fleet of 14 miniature ocean liners turned out by the Birchfield Boiler & Shipbuilding Company is an amazing and ingeniously complete version of a big ocean freighter reduced to the perfect sample of what can be done with welded steel and Diesel construction, and the No. 1 of this fleet, the guinea pig upon which all the experimentation has been done will prove of tremendous value in winning the war as a supply ship. The "F" ships of this series are designed for shallow draft operation in remote outports—anywhere: the tropics, Alaska or the South Seas, and can run a month at almost top speed without refuelling.

Probably they will function as a servant from a Mother ship or dry-land supply depot, but wherever they run, in hot or cold climate, their crew and machinery will dependably do the job without fuss or feathers and America can again say "Something New Has Been Added."

First of the 14 ships, the *F-48* represents practically everybody's limiting ideas as to size, speed, draft, equipment and cargo capacity. How they got a 100 ton freighter in a 99 x 21 x 8 ft. limit with a displacement of about 302 tons nobody can guess, but they did, and the trial trips under all kinds of adverse conditions, with a full board from the American Bureau along to cast their eyes on the proceedings, proved the ship runs smoother and faster fully loaded, or even overloaded, and will keep plugging even if some of the equipment such as a heavy towing winch mounted high up on the after deck should never have been permitted.

Of welded steel construction throughout, the system of hull design and bracing gives a fairly rigid but lightweight ship, roomy quarters for a crew of 12, including officers, and cargo handling facilities of ultra compact design that



GEARED DIESEL 99 FT. ARMY CARGO SHIPS

By CHARLES F. A. MANN

can load and unload from the most primitive dockage facilities with ease.

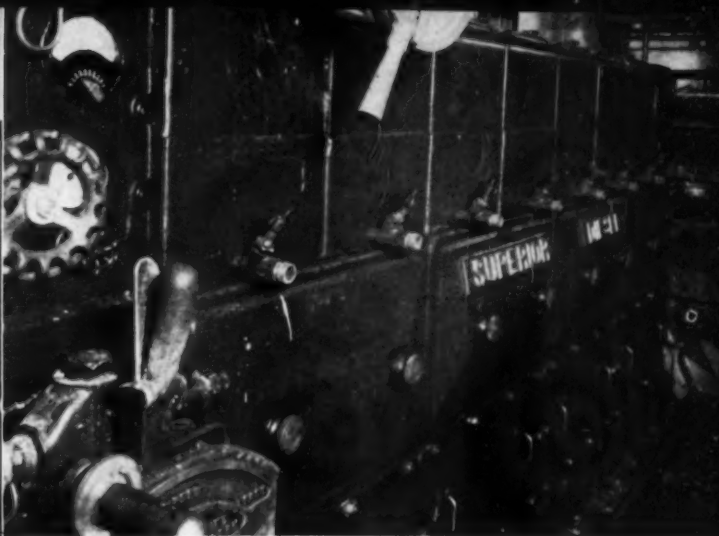
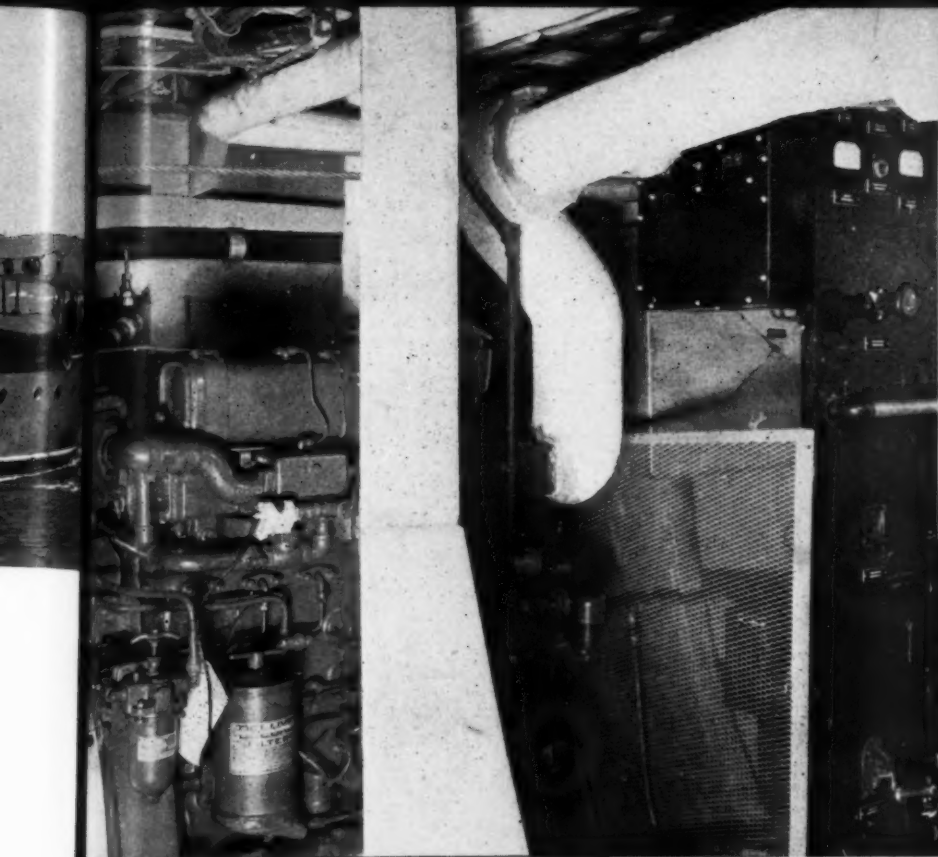
Below forward, is the ballast tank with 5500 gallon capacity, with chain locker, dry stores and crew's quarters for 4 in the two upper levels. The whole center of the ship is cargo handling area, with a squat, hollow welded steel mast upon which are 3 self contained Yale & Towne windlasses, each equipped with General Electric Gearmotor drums, built integral and attached at various points. One swings the boom and there is an 8000 lb. and a 2000 lb. windlass for handling cargo. Hollow steel sectional hatch covers are fitted and the uptakes from the elaborate ventilating system are at the four corners of this area. 11g forced draft ventilating fans are used.

Aft, on the poop deck, are compact quarters, in 4 complete staterooms, for the officers and crew, showers and lavatories, galley and small 8-capacity messroom, followed by galley stores in the after part, over the rudder gear. Above this is the pilot house and radio room, followed by a covered area upon which two 12-person steel lifeboats, Lee Bennett towing winch and a "loafing" space aft for the crew under the canvas cover. Oh yes, this same canvas awning will keep snowflakes off, too!

Below this area is the compact machinery space, centered about an 8 cylinder, $8\frac{1}{2}$ x $10\frac{1}{2}$ in. medium speed Superior 4 cycle Diesel engine, driving a 3 bladed 58 x 47 in. Coolidge bronze propeller, through a 675 to 300 rpm. National single reduction gear built almost integral with the Superior Diesel. Thrust bearing is built into the reduction gear. A Goodyear Cutless rubber bearing is fitted aft and also a plain steel plate rudder, driven by a Moore-Klamath electromechanical steering gear, with full hand wheel cutout. A Master electric motor drives the steering gear.

An 8 Bottle Walter Kidde CO_2 system is fitted; Ingersoll Rand service pumps; National Supply Co.'s welded steel air bottles; three 18 x 64 in. overall and 275 lb. pressure; Baker Ice Machine for the rather large refrigerated cargo stores forward of the engine room in a separate compartment; double bottom fuel capacity of 5140 to 5700 gallons; fresh water capacity of 1120 gallons and potable water stores of 500 gallons and 150 gallons of lube oil.

Freshwater cooling is employed in the Diesel, with a National Heat Exchanger. A total of 9 x 14 x 8 ft. of insulated refrigerated storage space is installed.



Main engine for the "F" ships is this Superior 300 hp., 8-cylinder Diesel. Note Alnor pyrometer.

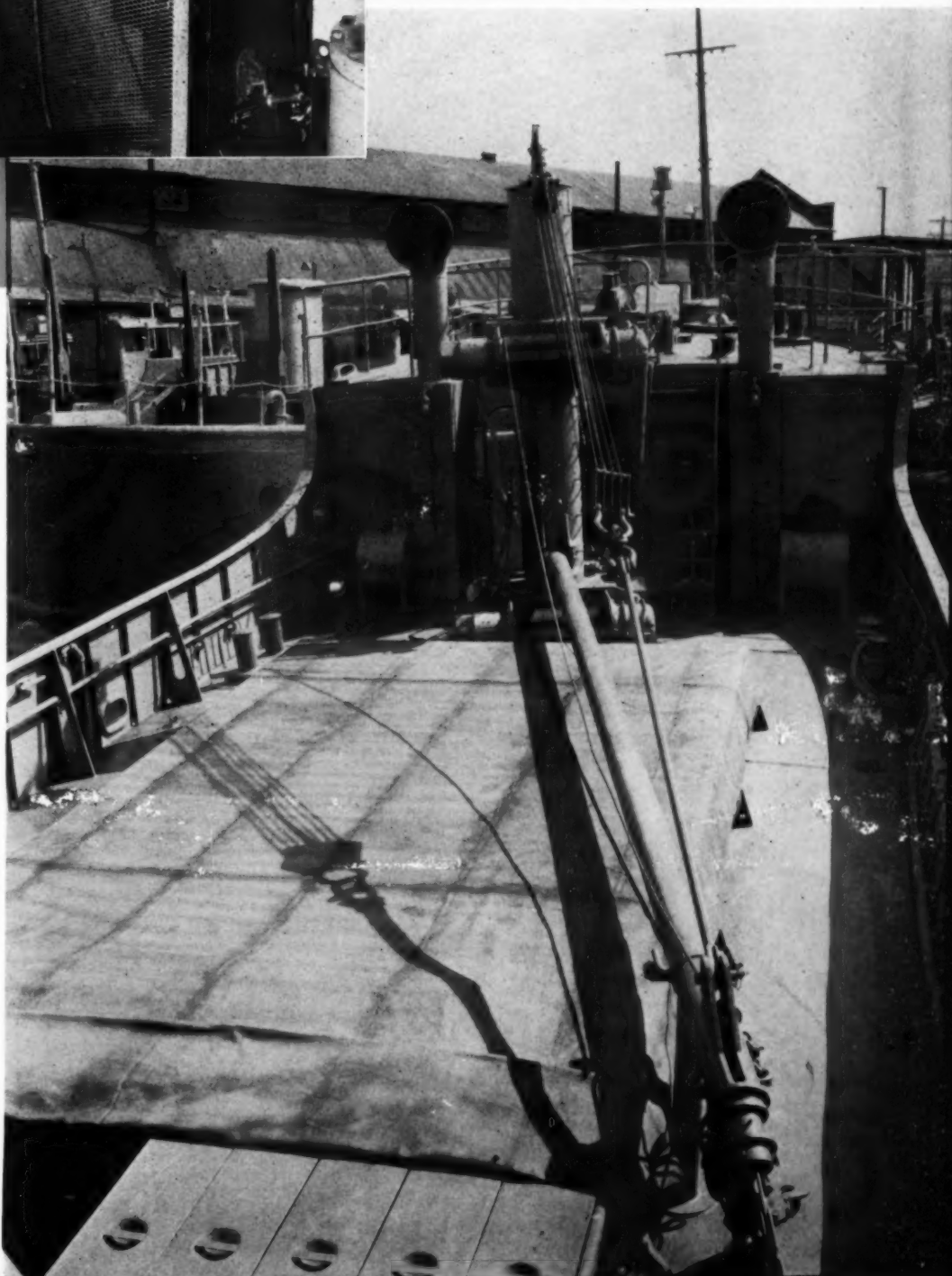
Upper left: "F-48," one of 14 pint size army Diesel cargo vessels on trial run. Above: Buda-Lanova Diesel auxiliary generating unit. Note Purolator fuel- and DeLuxe lube filters.

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Burgess intake snubbers are fitted on the main Diesel, as well as 2 Nugent fuel oil filters and a Crane Lube Oil Clarifier and a 28 Cell Edison storage battery. Pacific air type fresh water system and McCord Air heaters throughout are fitted, steam for which is supplied by a very small Preferred Utilities Co. oil burning boiler. The Auxiliary Diesel set is a 6 cylinder 25 kw. Buda unit, equipped with Leece Neville electric starter, Purolator filters, DeLuxe Clear Oil Filter, and Excellor Fuel Injection system.

The main engine has a Viking Safety Control system, a 12 kw. Westinghouse belt driven generator off the main engine flywheel with rated voltage of 120 and a Reliance Tachometer and Alnor Pyrometer. The main control station is beside the main Diesel, with telegraph to the pilot house, no pilot house controls being fitted. A Bludworth Direction Finder is also fitted, plus 2-way radio and the usual navigation equipment and lighting found on the highest class type of cargo ship.

Again Birchfields Organization, headed by Mr. A. T. Davies and Architect Silas E. Nelsen has done a unique job on mass-production of these 14 ships. They run from F-48 through F-56 and from F-91 to F-97 in the Birchfield series.



Cargo deck looking forward on the "F-48." Crew's quarters for 4 men are forward under raised deck.



Towboats of Tomorrow

General Motors Diesel Engines with

100 of these towboats, all powered by GM Diesel Engines with Airflex Drive, are being built by the U. S. Army Engineers for the Defense Plant Corporation. Several are in service.



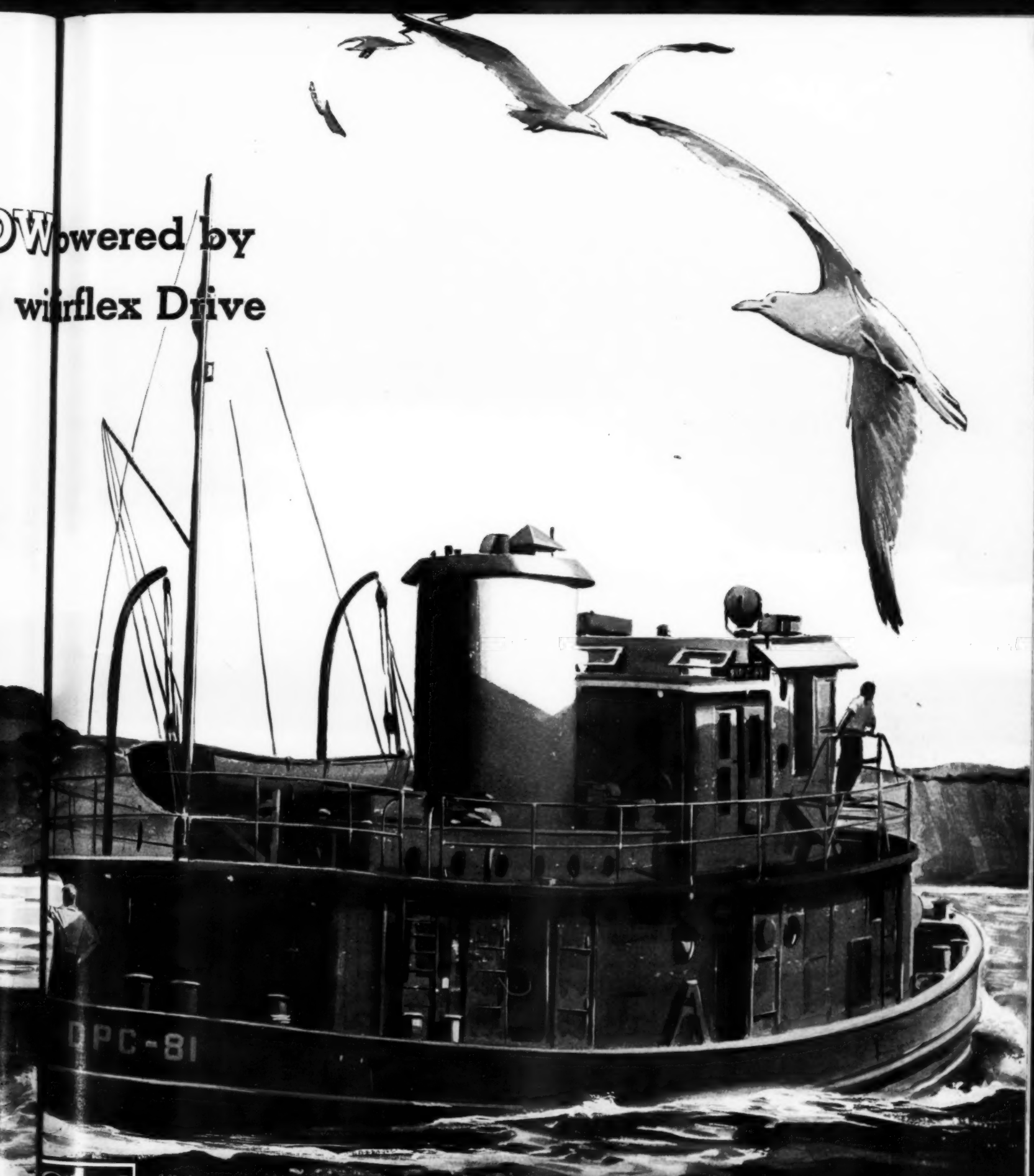
KEEP AMERICA STRONG



BUY MORE WAR BONDS

GM
GENERAL MOTORS
DIESEL
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Powered by
Witflex Drive



ENGINES . 150 to 2000 H. P. **CLEVELAND DIESEL ENGINE DIVISION**, *Cleveland, O.*

ENGINES 15 to 250 H. P. **DETROIT DIESEL ENGINE DIVISION**, *Detroit, Mich.*

LOCOMOTIVES **ELECTRO-MOTIVE DIVISION**, *La Grange, Ill.*

HOW GREEN IS BEN'S IMPERIAL VALLEY

**Retiring Tractor Dealer
Tells the How and Why of
Diesellized Farming**

By F. HAL HIGGINS



Diesel tractor show in Ben Hulse's main store at El Centro, Cal., before the war emptied the floor.

"KING BEN" of the Imperial Valley is retiring from Diesel tractor merchandising to raise whiteface beef on his Arizona and California ranches. The Cat Brass Hats have graciously handed Mr. Hulse a piece of engraved junk to hang on his office walls to remind him in his ranching days that he made retail history while anchoring their dealer West Coast chain and building their factories and reputation. But to your Old Reporter who recalls his first impressions of this below-sea level year-round food producing empire when he first encountered it back in January, 1928, Ben Hulse and the modern Imperial Valley are inseparable. He is "the man who has done most for the Valley," agree the most important men who are in it alongside Hulse. They made him a state senator and he served one term at Sacramento as a tribute for his services to Imperial county.

So, hearing that Ben Hulse was retiring from the tractor and equipment with a background unique in spanning the entire history of the Caterpillar and its rise from steam, through gasoline to its pinnacle in the Diesel tractor field where farming efficiency has reached its top in a year-round production that markets more than a carload of food for every man, woman and child in the Valley, your Old Reporter drove over to El Centro from San Diego and cornered him to get this story.

"I came out of Arkansas and went to Stockton as a kid helper on the Holt assembly line in

1910," admitted Mr. Hulse. "In those days, somebody from the factory took out a tractor when it was sold, and stayed with it till delivered and fitted into the job. Such a sale took me to the Imperial Valley for the first time in 1911 when I delivered a Holt 65. That's right at the start of the Caterpillar tractor, a few being sold by Holt for farming in 1909, just before I started at the factory. When you read that Los Angeles city engineer's report on the building of the aqueduct you will find a paragraph casually mentioning that the only equipment bought and used in its construction that failed was the fleet of Caterpillar gasoline tractors. They were junked in favor of mules for the desert transport service. It gives you an insight into the sales and service problems we had in those days of starting to sell a new idea.

But that first big sale of some twenty-odd units to the City of Los Angeles gave Holt needed cash and a lot of advertising that started big farmers with low marshy farms to buying to get power that would stay on top of the land instead of sinking out of sight. So, this "great failure" of Caterpillars on the desert at the start of Holt's Caterpillar building was turned to a springboard of success. That first wooden deck Caterpillar had a 65 hp. Uoria distillate-burning motor built in Peoria. The Uoria plant was purchased by Holt for the start of its east-

ern factory, and was starting to prosper on the upswing in road building before World War I, which suddenly catapulted it into world prominence when the British began ordering all the Caterpillars they could get for Army transport.

"I delivered three of these early Caterpillars in the Imperial Valley in 1911," continued Mr. Hulse. "The Colorado River Land Co. took one, and the other two went to Jerome & Cook.

There was no such thing as service in those days. We men in the shop who took the tractors out and delivered and started them spent half our time keeping them running afterwards with frequent trips from factory back to tractor.

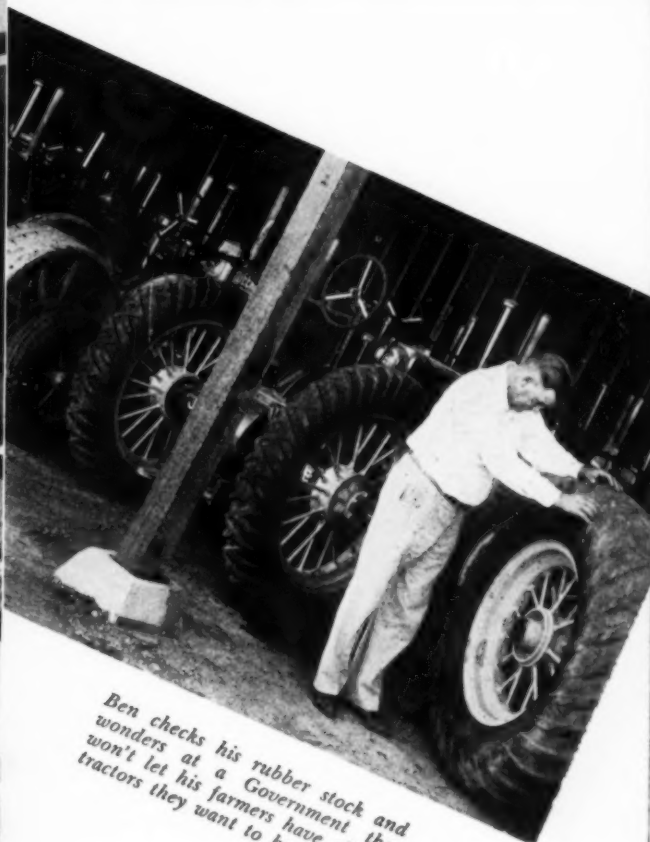
But Holt went along with these old tractors until the war when the 45 without a front wheel appeared, which was the first all-track machine. We had thought we had to have the front tiller wheel out in front until some legal action from some one who had a patent covering this feature forced the change. The 75 Holt Cat was started about 1916 and built till 1920. Then came the 5-ton and 10-ton all-steel Cats. The eastern and western models of these same Holts were always a bit different, by the way. There was a lot of rivalry between the two factories, designers and engineers having their pride, prejudices and personalities in those days that were expressed in the tractors they turned out.

"By 1921, Holt began bringing out the smaller Caterpillars. The T-35 rated about 20 hp. on

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State Senator Ben Hulse addressing his constituents who sent him to the Senate in appreciation of his contribution to the development of Imperial Valley.



Ben checks his rubber stock and wonders at a Government that won't let his farmers have all the tractors they want to buy.

two big important stages: from 1908 to 1910, and from 1928 to the present. The Diesel tractor has been the greatest advance the world has ever known. Never will there be another period to supersede this one that gave the farmer, contractor, logger and oil field the Diesel tractor. It is efficient, economical, perfect! My first period of these two important tractor eras of development began when a tractor was built that could be sold to the farmer because it was somewhat efficient. It took a good farmer to operate it, however, and it cost plenty in time and money to keep it going. In this period the track-type began to show itself as belonging in the farm power picture for the first time in its century and a half of development.

"As to this present war, we couldn't have begun to have fought it successfully without our mechanized farmer. The country had to be self-sustaining as to food. That would be impossible without this highest food producing efficiency in the world, which has reached its perfection right here in the Imperial Valley where we operate the biggest track-type Diesels the year round for food production. I think I can take pride in saying that in the building up of this valley over the past 33 years, I've seen the greatest agricultural feat in the world's history of food production and marketing. The Valley years ago began annually growing, shipping and

the drawbar, and the T-40 about 30 hp. With them came much more efficient machines with enclosed gears and much less field service. Manufacturers were learning to build their tractors in the factory instead of out in the field after sales were made. The war had taught them a lot on heat treating, which was also coming to the tractor industry from the automotive manufacturers. Those pre-war chain-driven tractors with gears outside were really terrible when we look back from today's stream-lined Diesel-powered heat-treated moving power houses!

"About 1923 came the 2-ton, which was about 20 hp. Was it good? Say, you can find plenty of them still being traded in and re-purchased by farmers all up and down the West Coast, and I understand the Australians rate them even more seriously than here. In fact, after the merger of Holt and Best in 1925, the Australians wouldn't buy them unless they were assured that they were Holts.

"Well, I'll say I've seen the greatest development of tractors in history; been right in and part of it. I divide the tractor development into

marketing more than a carload of food per every man, woman and child in its population. We have developed what I like to call 'programmed agriculture' until our products are being planted, harvested and shipped every day of the year in just the right volume to get the best market price.

"As to the tractor engineers, designers and builders, let me state from my experience in factory, dealership and farming that they have always been at least ten years ahead of the farm implement designers and builders. That means in our valley here where we have led the world in many of the most advanced ideas and tools to go with the tractors; things we had to work out on these ranches operated by the most efficient food producers for the biggest food markets. I've seen and helped develop hundreds of pieces of equipment to go behind our tractors.

Things like the field baler that four eastern manufacturers now offer the world; the bale pick-up loader that since war put farm work into the hands of women is wanted by the British to insure its hay harvest. In this Valley this gadget now enables hay growers to pay big colored boys handling the bales from this machine as high as \$135 a week on a piece basis. That piece of machinery, for the first time in history, I believe, upsets the old established fundamental that farmers can't pay their laborers wages equal to wages paid by war industries. These lads this year in the Imperial Valley are getting more money and less danger in their work than are shipyard and plane factory workers. The rubber roller flax harvester is one more Imperial Valley machine idea that is sweeping the world. There are dozens of others in bedding, planting, alfalfa harvest, beet harvesting, etc.

"So you want to know what I would do to win the war on the food front? OK; I've nothing to sell, so I'll stick my neck out even if they do point to my state senator's term as a Republican. I'm out of politics and out of selling, so—I'd first make an analysis of the food possibilities in each agricultural area based on small areas of not over 2 or 3 counties. Choose the real farmers to make this analysis-survey to get an estimate of the machinery needed. Use the good land and see that the real farmers get competent help. It's no time or place for marginal and sub-marginal land, men and tools. If these fundamentals are followed, we won't go hungry. I stress competent help on the machinery because that means everything. The use of a lot of untrained and incompetent help is the wrong attitude. We've had too much of that about our good farmers because they are suc-

cessful and 'big' and use big Diesel tractors of 75 to 100 hp. But look what one man, or a shift of three men, on a single 90 hp. Diesel tractor produces. It's economy, efficiency, and produces food!

"Right here in the Imperial Valley where we run these big tractors as much as 6,000 hours per year we can on a comparatively small acreage—about 450,000—produce food to astronomical figures with the fullest use of the biggest Diesel tractors, our highly skilled farm managers and owners and the least amount of man labor per ton of food. Figure the manpower in a 3-shift operation of a 75 hp. Diesel tractor. Over 1700 manpower work per day done by three men on this tractor! The Bureau Boys in Washington may laugh this off as just another Grapes of Wrath tractor story. But our growers do it and can contribute more food per man than can any other group of men on any other patch of soil on this earth. And these big Diesel tractors are more economical in material and

labor than the manufacture of three or four smaller tractors with operators on each. And yet they argue back there in Washington that we ought to get along with smaller tractors than we farm with because we are BIG in ideas farmers and Diesel tractors!

"Take the wheel tractors—and I sold them, too, for row crop and mowing—and their operation and tempo was set back when the Jap shot the rubber off their wheels at Pearl Harbor. It now costs 25% more to operate them on steel, and the farmer loses a lot more time in field failures, repairs and service. Turn loose the Diesel and this set-back can be largely made up. Leave the American farmer with neither rubber on his wheels nor Diesels in his track-type tractors and the Government gives our food producers a handicap that sets them back a decade before the war instead of helping them get the jump on the past at a time when a Food Pearl Harbor is facing the U.S. in its war effort in the next two years if the war lasts that long.

A Caterpillar Diesel tractor loosening carrots so Mexicans can pull and bunch them for market. This outfit harvests 7 to 9 carloads a day.



Leveling land for peas, grain and flax on the Sinclair, 2500 acre ranch in Imperial Valley.



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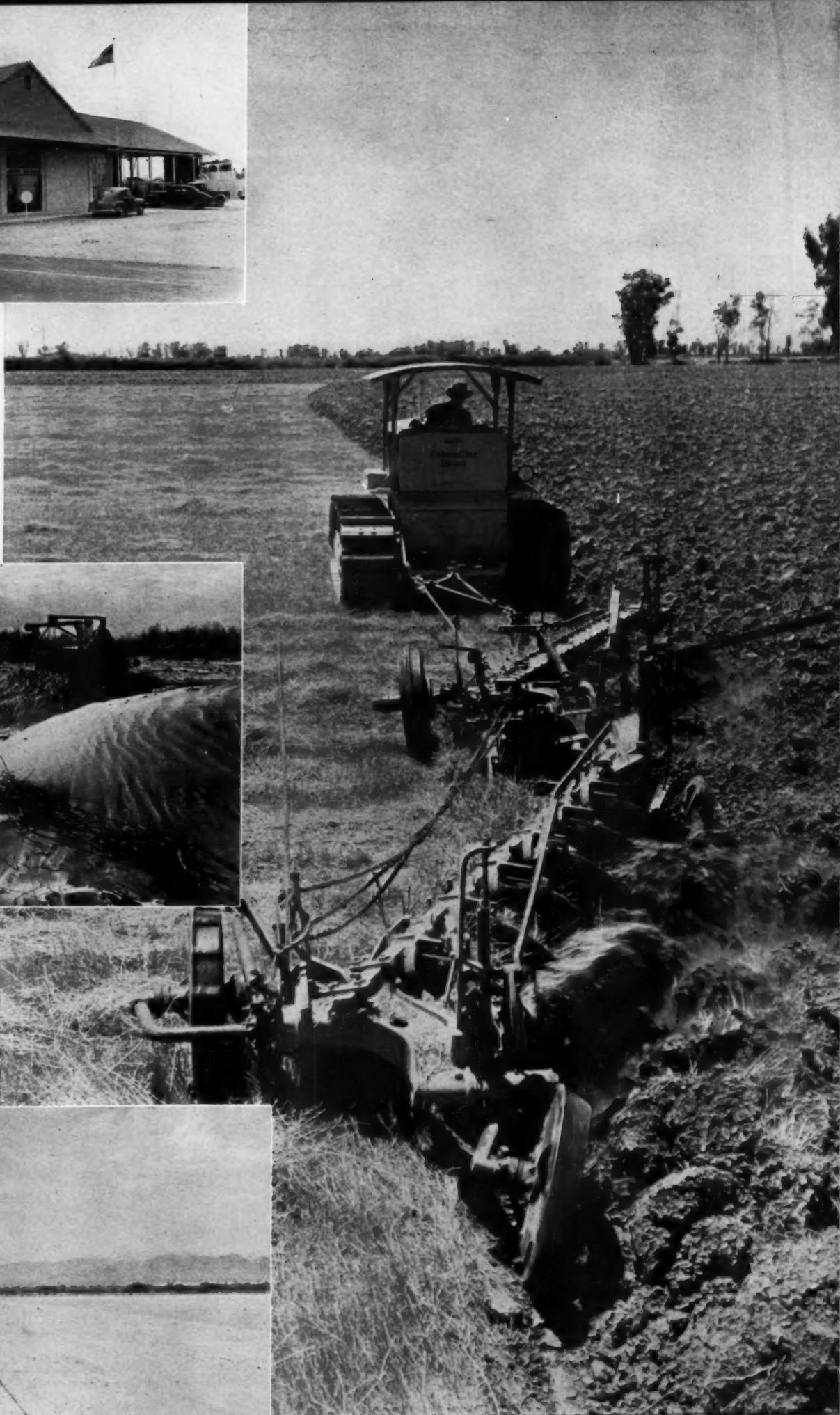
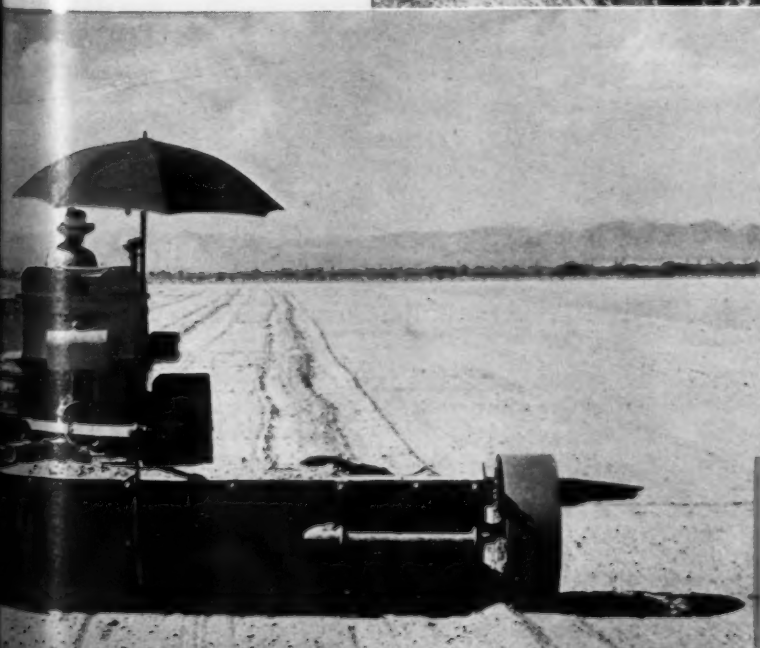
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Ben Hulse's Yuma, Arizona, branch store. Through his branches Ben sold nearly \$25,000,000 in Diesel tractors and farm equipment before retiring.



New farms from raw desert land in Imperial Valley where the All-American Canal and Diesel tractors have created the most productive farm land in the world.



Diesel tractor plowing for flax in Imperial Valley. Flax is a big war crop, reaching 140,000 acres this year.

SUPERVISING & OPERATING ENGINEERS' SECTION

"TAKING THE 'HIT' OUT OF HITLER"

By R. L. GREGORY*

RECENTLY in a small city in the middle west, the coveted Army and Navy "E" was awarded to a local plant in recognition of that plant's efforts in the production of war materials. This award was one of many made to the nation's plants for outstanding service. The writer was in a group of power plant men discussing these awards a few days later, when he overheard this statement made by one of those present, quote: "I have often wondered why, in making these awards, the Government never takes into consideration the power plants throughout the country, that are really the heart of this production effort. There are many industries in small communities which depend upon the local power plants for the power and light which makes it possible for them to make such successful records, yet these power plants are seemingly overlooked in these awards for meritorious service and I am sure the boys who are keeping them rolling would appreciate the recognition of their efforts."

Now there was a lot of truth in that statement, yet the speaker probably did not take into consideration the limited facilities of a Government at war, in ferreting out those industries and individuals who are giving their all that this conflict can be drawn to a successful conclusion. There are, no doubt, many small plants and many individuals whose efforts are just as great, yet who have not received special recognition, as the efforts of those who have.

* Chief Engineer, Municipal Water and Light Plant, Hillsdale, Michigan.

In the conduct of this war, our Government expects each plant, each individual to give his best efforts, to cooperate one hundred per cent in the allot production schedule, and if that plant or individual is not cited for a special award, he should derive a lot of satisfaction in the knowledge of a job well done, and the privileges he will derive from a successful conclusion of the war. This in itself should be ample reward.

In the operation of many of our power plants, problems arise daily, which must be solved without delay, in order to maintain uninterrupted service, and the writer wishes to give a few examples of some of these which have come to his attention and how they have been corrected.

About a year and a half ago in a certain plant, a bad leak suddenly occurred at the joint between the liner and the block on a large Diesel unit. The load demand by plants in war production, upon this plant was such that it was almost an impossibility to take the unit out of service for any appreciable period. In order to repair this leak which occurred at the joint as shown in figure 1 the proper thing to do was to pull the liner, install a new gasket and replace the liner. Since the unit was of considerable size, it was necessary to secure a special rig from the manufacturer. Then the element of time being the main problem, it was doubtful whether the liner could be removed in the short outage time available, and replaced in time to pick up the load, without hampering the production of the war plants dependent upon the unit for power.

The leak at this joint was such that considerable cooling water was being wasted, and since the system was of the closed type, it was necessary to add considerable makeup daily. In addition to this was the nuisance of water leaking down the side of the unit, into the casing around the cam shaft and eventually leaking down through the drains to the crankcase. So it was decided to experiment with some temporary repairs which might possibly eliminate the trouble until such time as a permanent job could be accomplished.

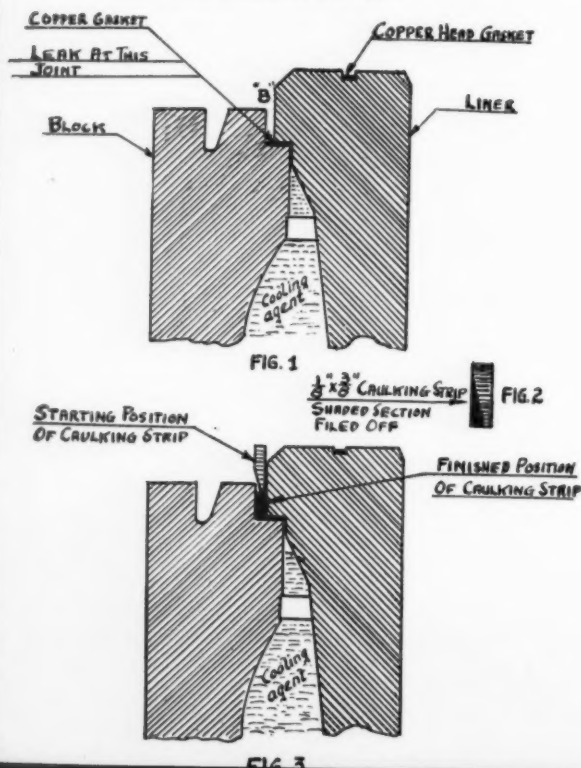
The unit was shut down for a few hours when the load demand did not require its operation,

and the cylinder head removed. Inspection showed that the copper gasket forming the joint between the liner and the block was defective and had squeezed out at one point. Special caulking tools were soon made and the copper gasket caulked back in place. Then a layer of permatex was inserted followed by a layer of twisted oakum, which was caulked tightly in place. This was followed by another layer of permatex and another layer of oakum, all being tightly caulked down, until the space at "B" in Figure 1 was well filled. The cylinder head was replaced and the unit put back in operation. The repair held for several days, but as there was no elasticity to the permatex and oakum, the expansion and contraction of the liner soon developed another leak.

Finally it was decided to try something which was very unorthodox and which many engineers would disapprove, yet to date has proved fairly effective and satisfactory as a temporary repair. In the maintenance department, at the plant there was some caulking strip left over from a turbine reblading job. This caulking strip was of a special material, annealed so that it was very pliable, yet having characteristics which would conform to the expansion and contraction of the liner with the varying change in temperature, especially during short periods of outage when the unit was not needed. This caulking strip was about $\frac{1}{8}$ " thick by $\frac{3}{8}$ " wide and when ground off to the shape shown in Figure 2 was easily inserted in the space "B."

The former material was all removed, the groove between the liner and block well cleaned and partially filled with glyptol. Then the caulking strip was inserted and caulked in place by going around it several times until the space "B" was entirely filled with the metal. This repair took only a few hours of normal outage and to date has not hampered the operation of the unit, and the unit has been available to load demand. When the time arrives and ample outage can be had without interruption to load demand, permanent repairs will be made by removing the liner and inserting a new gasket.

To cite another problem which was presented in still another plant. On one of their units they ran into trouble with the crosshead pin And now please turn to page 72





Official U. S. Navy Photograph

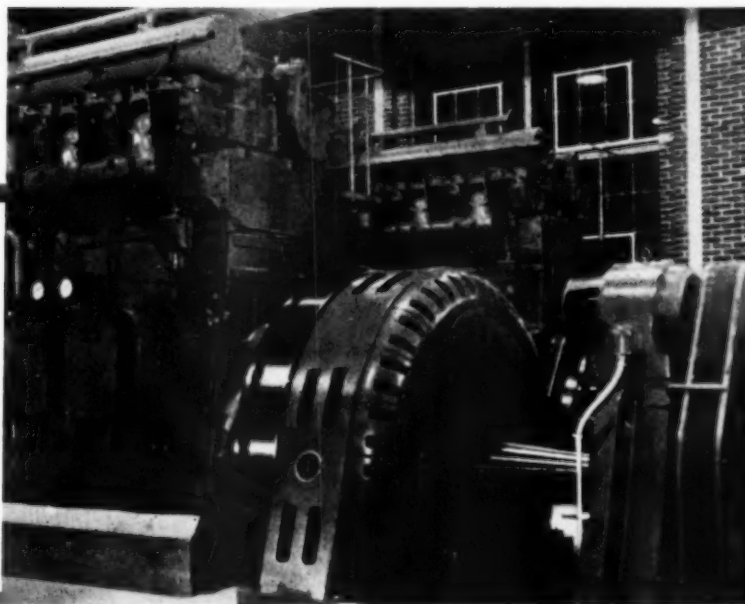
INVASION ABROAD

demands increased efficiency at home. For lubrication and compression seal that develop full DIESEL output use . . .

.....SINCLAIR RUBILENE OILS.

Rubilenes promote increased service hours under heavy loads . . . reduce ring and liner wear . . . save on operating and lubrication costs.

(Write for "The Service Factor"—published periodically and devoted to the solution of lubricating problems.)



SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY (INC.), 630 FIFTH AVENUE, NEW YORK 20, N. Y.

EVERY Diesel tractor in California agriculture is mobilized for the war on the food front. In spite of the lamentable facts of "commission and omission" by men in high places that has brought the US face to face with a food crisis in this year of 1943, every farm tractor dealer on this West front is backing up his farmers, and the Diesel tractors they have bought since 1931 to put this area far out in front of the world in efficient food production. The two wartime annual farm machinery conferences at the University of California agricultural engineering building at Davis have focused attention on this efficiency and the high importance of the Diesel tractor and its service. They must be kept rolling without new tractors to strengthen their ranks, for Bureaucrats at Washington have banned any new tracktype or Diesel tractors for the farm.

At this annual gathering of the farm machine industry of California as represented by its branch house, dealer and manufacturer officials, the Diesel tractor builders all put on special service schools with their best men in charge to pass along ideas to University engineers, dealers and farmers. Cletrac with its Hercules Diesel engine, Allis-Chalmers with its General Motors Diesel and International Harvester Company and Caterpillar Tractor Co., each with their own Diesels all sent up special trucks and exhibits with men from their branches in charge. The pictures show three of them as seen last year at the first war farm machinery conference.

The other pictures were taken at various Caterpillar dealers' places of business up and down the West Coast as they have worked out their own efficient methods to keep the powerful farm tractors with Diesel engines going in spite of increased hours, less skilled operators and shortage of parts and service men. The California farmer started buying his Diesel tractor power in 1931 when Caterpillar started selling their tractors with such economical power that the big farmers quickly swung to Diesel tractors and profit to get out of the depression that had most of them broke or hanging on the ropes ready to quit. From Canada to Mexico the trend spread with International Harvester Co. appearing two years later with its TD35 that also gained great popularity and put both dealers and farmers back in the game. The two rival concerns have built up chains of strong dealerships throughout the farming areas of the West. Allis-Chalmers first tried the Hesselman semi-Diesel in its tractor, finally coming to the GMC. Cletrac adopted the Hercules from the start.

CALIFORNIA FARM MACHINERY

WAR CONFERENCE

FEATURES DIESEL MAINTENANCE

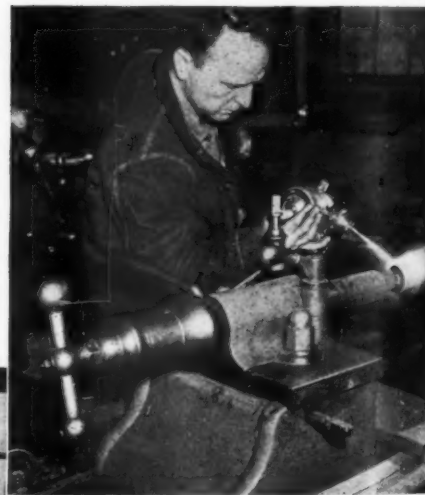
By
F. HAL
HIGGINS



Holt Bros., Caterpillar Dealers, exhibited at the Conference this outfit used for servicing Diesel tractors in the field.



Above and right: A few pounds of metal sprayed on like this frequently saves replacement parts.



Left: View of the International Harvester exhibit featuring its fuel injection system. Below: The Allis-Chalmers instruction truck features the General Motors, 2-cycle Diesel, used to power Allis-Chalmers trucks and tractors.



"Fall Maintenance of Outside Equipment"

Conducted by R. L. GREGORY

Editor's Note: In this department we provide a meeting place where Diesel and Gas engine operators may exchange mutually helpful maintenance experiences to keep our engines in top condition. Mr. Gregory edits your material and adds constructive suggestions from his own wide experience. This is your department—mail your contributions direct to DIESEL PROGRESS.

WITHIN the next few weeks, weather conditions will be changing considerably and now is the time to attend to the maintenance of the equipment which will be subjected to weather changes, such as air filters, storage tanks when located outside the main buildings, the oil handling equipment, heating system, etc.

Many plants are equipped with filter houses adjacent to the main plant, the air supply being taken externally, passing through the filters, located in the filter house and then on through the air intake pipes to the units. Due to winds, storms, etc., a lot of dust, dirt and insects accumulate on the air filters during the summer and early fall months. Now is the time to remove the filters and give them a thorough cleaning. If this dirt is allowed to remain in the air filters you are apt to experience a clogging of the filters on cold damp mornings when the temperature is near the freezing point. The cool moist air is drawn into the filters and because of the accumulation of dust and insects its passage is retarded, and cases have been found where this combination of moisture and dust have practically closed off the filters making them inoperative. Therefore these should be attended to during the nice fall weather.

Special attention should be given to storage tanks at this time, especially when located outside the plant. Most tanks are equipped with some method of heating, generally by means of coils through which either steam at low pressure, or hot water is circulated. The tanks should be drained and thoroughly cleaned to remove any sludge, moisture and other foreign materials. After cleaning the tanks, these heating coils should be inspected, to determine whether there are any leaky joints or leaky pipes which will allow moisture to pass into the fuel.

Unloading pumps, transfer pumps, especially the type used in many plants which have heat-

ing equipment included in the design, should be well gone over to see that the passages are clean, the heating heads are free from rust and scale and in good condition for winter operation. Where possible the pipe lines should be flushed and cleaned out to remove the sludge accumulation which is bound to adhere to the surfaces of the pipe lines.

Many Diesel plants depend entirely upon utilization of the waste heat from the exhaust for space heating during the cold weather. Some use waste heat boilers, but the majority use the favored hot water system, the closed type of radiators or coils which are filled up when the system is put in operation in the Fall and then drained during the warm weather. With this system the water is passed through coils located in the exhaust mufflers by means of a circulating pump, then on through the heating system, the drains from which collect in a common return which takes the warm water back to the suction side of the circulating pump. Most systems of this sort are equipped with expansion tanks and relief valves to insure against overheating and take care of the expansion in the system.

In heating systems of this type, which by the way are quite common, when drained during the summer months, the coils located in the exhaust mufflers are dry and with no moisture in them are subjected to considerable expansion and contraction as the units are in operation or out of service as the case may be. This condition is hard on pipe joints, gaskets, etc., and frequently unless inspected and taken care of before being put into operation in the fall, when filled with water several leaks are found and the system has to be taken out of service to make necessary repairs. Prevention of this trouble can be had by inspecting your heating system now and repairing it before you want to put it in service. Valve stems should be repacked and pumps gone over. The expansion tank should be checked and relief valves examined to make sure that they operate at the proper pressure. Most systems when in proper working order operate on from 10 to 15 lbs. pressure. Do these maintenance jobs now to ready outdoor equipment for cold weather.

"Emergency Repair of Leaky Gasket"

The following letter, submitted by Mr. W. F. Hamacher of Grand Rapids, Michigan, tells how he made an emergency repair on a leaky head gasket, quote:

"I read DIESEL PROGRESS with interest, especially the exchange page, and herewith submit an idea of my own for what it is worth to other readers. Perhaps it is an old trick, but it certainly came to my rescue.

"When we had a case of a leaky head gasket, we were unable to obtain a new solid copper head gasket immediately. We took a strand of number 14 solid copper wire, and placed it directly in the center of the old gasket. We then drew down the head, and the gasket held as good as ever, and we have had no further trouble with this gasket, even though the unit has been in daily operation for over a year since this repair was made."

Such ideas as the foregoing are all well worth while and in most instances prove to solve an emergency problem. As time goes on and replacement parts become scarcer and shipments more infrequent, many of our maintenance crews and supervisors are going to have to resort to original ideas in keeping up repairs.

With this in mind, we want our readers to feel free to pass on any little tricks like the foregoing, which have helped them carry on their maintenance work, so let us hear from you.

"Piping Up Drains from the Various Stages of Air Coolers"

This department received a letter from one of our readers, telling of experiencing trouble with a continual clogging up of the drains or blow down lines from his air coolers. However in submitting the letter, he failed to give any details of piping arrangements of these blow-downs, and also failed to sign the letter.

If this writer will again communicate with this department, giving a rough sketch of the piping arrangement of these blowdown lines, and sign . . . And now please turn to page 82 . . .



"ALNOR" *Protection*

FOR THE TWO MAIN FAIRBANKS-MORSE DIESELS ON THE "HENRY S. STURGIS"

Modern from streamlined superstructure and raked stacks to the last detail of interior appointment and machinery—the "Henry S. Sturgis" was recently completed by St. Louis Shipbuilding and Steel Company and added to the Ohio River Company fleet. Her engine room gauge board carries two latest type "Alnor" pyrometers, of the design developed to meet Navy requirements, as protection for the two, 7-cylinder, 805 hp. F-M propulsion Diesels. By far the majority of modern Diesel marine, as well as stationary, installations get modern "Alnor" protection.

Specify and Buy "Alnor"

Illinois Testing Laboratories Inc.

423 NORTH LaSALLE STREET, CHICAGO, ILLINOIS

MANUFACTURERS OF "ALNOR" AND PRICE INSTRUMENTS — PRODUCTS OF 43 YEARS' EXPERIENCE

Diesel-Electric Road Switchers Hard Workers at Pig's Eye Yard

TWO new 1000 hp. Alco-G.E. Diesel-electric road switchers that have been working 'round the clock at the Chicago, Milwaukee, St. Paul & Pacific Railroad's "Pig's Eye" classification yard in South St. Paul since May, 1943, have released four older 2-8-2 steamers for road service. Normally used in branch-line freight service, the two Diesel-electric units were assigned to the bustling Pig's Eye yard to handle greatly increased switching requirements.

The Pig's Eye yard has 19 tracks (30 to 100 cars) for classification, 6 tracks (100 to 110 cars) for receiving and transfers, 3 rip tracks (15 to 25 cars), 1 dump track (45 cars) and 1 running track to the roundhouse. All east and west freight, as well as trains to Duluth and the south, are classified or made up in this yard. It has a capacity of more than 3500 cars a day and at present is handling from 2500 to 3000 cars a day. The two Diesel-electric road switchers work the lead and do all the switching in the east end of Pig's Eye. The longest drag is about 35 cars (1/4 mile) from the receiving track to the classification tracks.



All the work in the east end of the St. Paul Pig's Eye Yard of the Milwaukee is handled by these two Alco-G.E. 1000-hp. Diesel-electric locomotives which released four 2-8-2 steamers for work elsewhere on this busy system.

On occasions, these road switchers are used for the 10-mile transfer run to Minneapolis. For example, one day it was an 18-car (80-85 tons) troop train to Minneapolis. On the return trip to St. Paul, which is down grade, the drag was 2500 tons of freight. On another occasion, the return load was an 8000-ton ore train. The run to Minneapolis has 7 miles of grade, maximum 1.2 per cent, and the road switchers will haul 1300 tons up it without a helper.

It is estimated that these Diesel-electrics save 8 hours locomotive time out of every 24 hours. They have 1600-gallon fuel tanks, and are taken to the roundhouse only once a week for about

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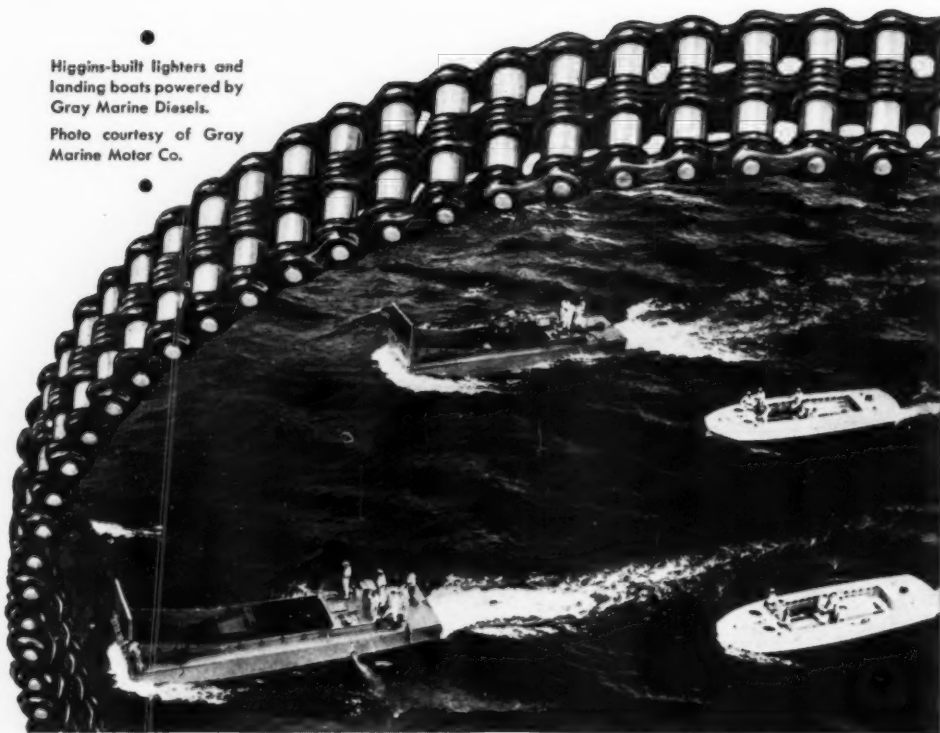


INTERCHANGEABLE PARTS

The **Marquette** METAL PRODUCTS CO.
CLEVELAND, OHIO

Higgins-built lighters and landing boats powered by Gray Marine Diesels.

Photo courtesy of Gray Marine Motor Co.



DIAMOND DRIVES

have great power transmission capacity for their weight, just as

GRAY MARINE DIESELS

have great power output per pound

● Small boats—lighters, landing boats, picket boats, mine sweepers—are playing a big part in winning the war, and Diamond Roller Chains are used regularly in the engines of a large majority of these craft.

Compactness is the essence of small boat engine design, therefore the engine which can be relied on to deliver the most power for the least weight and bulk is the optimum design.

Compact, reliable, high output Gray Marine Diesels—good small boat engines—are used extensively by our armed forces to power all types of light craft.

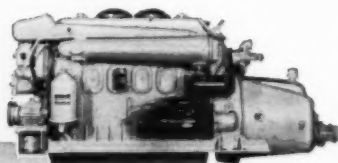
Compact, reliable, high power transmission capacity Diamond Drives—good equipment for all engines—have been proved by 32 engine builders on more than a hundred different models.

Diamond Drives simplify engine design—they are positive, run quietly, and are long lived.

If you have engine conversions, engine redesigns, or entirely new developments in prospect, let our engineers—

with years of engine application experience—cooperate with you in the design of timing and accessory drives. DIAMOND CHAIN & MFG. CO., 407 Kentucky Avenue, Indianapolis 7, Indiana. Offices and Distributors in All Principal Cities.

Fast 60-foot Army ship built by Chris-Craft, powered by a pair of Gray Marine Diesels.



Six cylinder, 165 h.p., 2000 r.p.m., equipped with Diamond Roller Chain lubricating oil pump drive.



30 minutes to take on fuel oil and sand. All other items and daily inspections are taken care of during the 20-minute lunch periods for the crews. Once a month the units are out of service 8 hours for the monthly inspection. Fuel oil consumption averages 5 gallons per hour—800 gallons per week. Four Diesel-electrics handle 12 of the 28 tricks in the Pig's Eye yard—10 steamers handle the other 16 tricks.

Time-Saving Compressor Calculator Offered by Cooper-Bessemer

AN ingenious compressor calculator, designed to save critical time in computing compressor requirements or in estimating the performance of present compressor units, has been prepared by the Cooper-Bessemer Corporation, builders of compressors and gas and Diesel engines.

The calculator, which is made of heavy stock, is pocket size, measuring only 3½ inches by 8½ inches. Of slide rule design, this unique engineering tool can be used for quickly estimating the volumetric efficiency, brake horsepower and total piston displacement of any make of compressor, although it was originally intended for use primarily with Cooper-Bessemer's well known Type G-MV engine-driven compressor units.

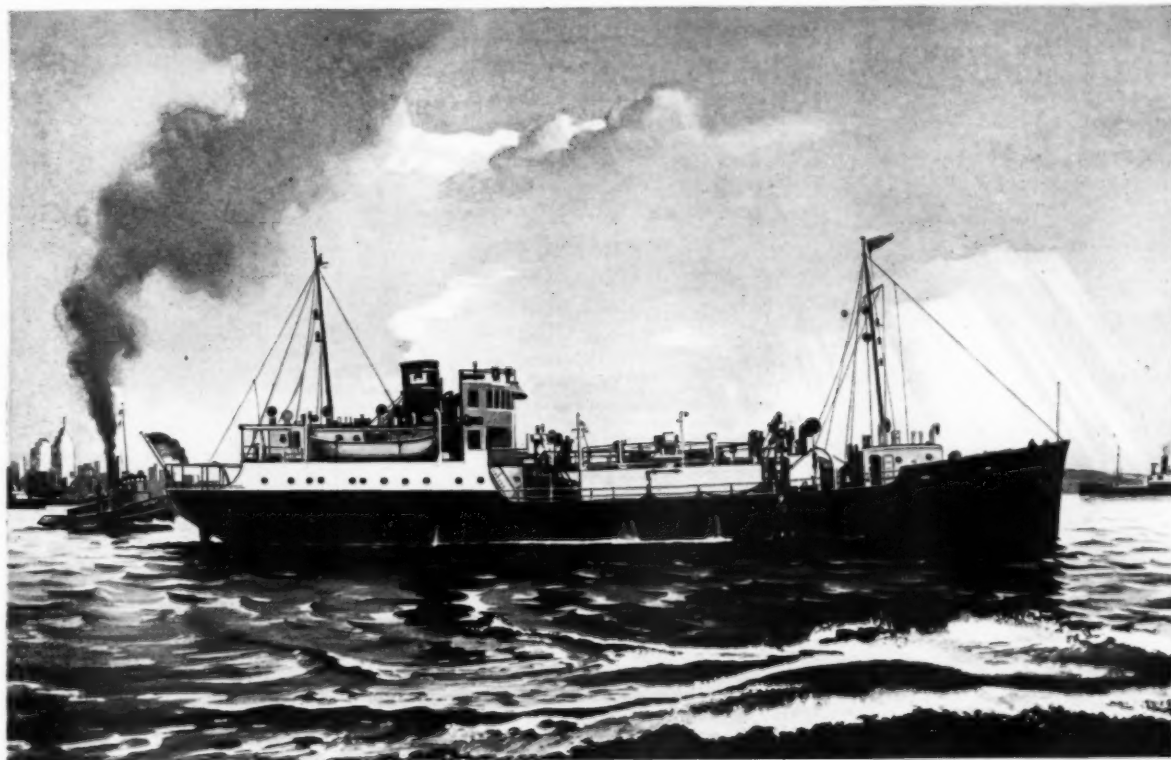
The device, which represents many years of technical and compressor-building experience, has proved so useful that it is now offered gratis to all responsible engineering and operating executives as long as the limited supply lasts. Requests should be directed to the Cooper-Bessemer Corporation, Mount Vernon, Ohio. A sheet of complete instructions will be sent with each calculator.

Noteworthy New Burgess Bulletin

THE Burgess Battery Company, Acoustic Division, announces a new bulletin, No. 447, on its complete line of Diesel exhaust noise control equipment. The 25-page bulletin, measuring 10 in. x 13¼ in. carries illustrations and descriptions of Burgess snubber installations in a wide variety of critical locations such as hospitals, hotels, office and public buildings, ships, trains, etc., and reproductions of its series of engineering data sheet advertisements which have appeared in DIESEL PROGRESS during the last two years. This unusually attractive and informative bulletin is available upon written request on your letterhead to Burgess Battery Company, Acoustic Division, 2815 West Roscoe Street, Chicago 18, Illinois.

WHAT!

FLUID DRIVE A HOPPER DREDGE?



U. S. Engineer's Dredge Pacific equipped with American Blower Fluid Drives.

Keeping shipping lanes open, dredging harbors and canals is part of the all-important work assigned to the U. S. Engineer Department. And this U. S. Army Dredge, equipped with American Blower Fluid Drives, is playing an important role.

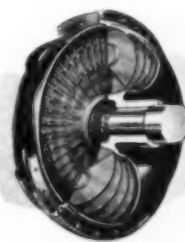
Fluid Driving through Hydraulic Couplings on a Diesel propelled hopper dredge has two very important advantages—

1. The Fluid Drive prevents transmission of torsional vibrations and shocks from the Diesel Engine.
2. The Fluid Drive variable speed control permits the operation of the vessel at creeping speeds.

Building Fluid Drives for the U. S. Navy, the Merchant Marine and for war planes is our job now.

After Victory, the skill and experience gained in years of designing and building Fluid Drives will be available to you.

Don't be afraid to look forward to the future. Plan your post-war products to incorporate the desirable characteristics made possible by Fluid Drives.



Cutaway view of American Blower Fluid Drive. There is no mechanical connection between driving and driven members.



AMERICAN BLOWER

AMERICAN BLOWER CORPORATION, DETROIT, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO

Division of AMERICAN Radiator and Standard Sanitary Corporation

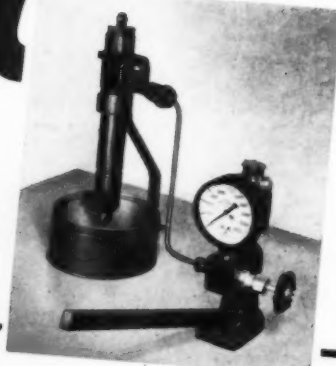


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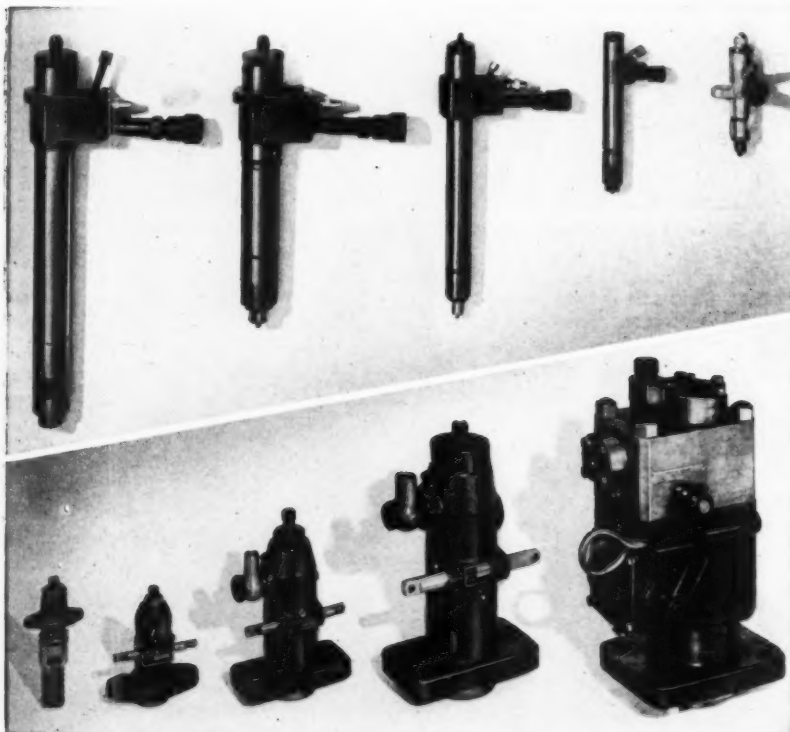
DEPENDABLE DIESEL FUEL INJECTION EQUIPMENT

Throughout the diesel industry, Adeco stands for the finest in fuel injection equipment. Years of experience in pioneering equipment for America's diesel needs have resulted in an outstanding line of fuel injection pumps, nozzles and nozzle holders. Today's performance of this dependable equipment merits your confidence for tomorrow's requirements.



ADECO NOZZLE TESTER For Economical Maintenance

America's most widely used Nozzle Tester enables any mechanic to make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Compact, portable, sturdy, precision-built. Pressures up to 10,000 p.s.i. Tests both large and small injectors. Avoids costly delays and possible damage to engine. Best for economical maintenance. Write for new illustrated bulletin.



AIRCRAFT & DIESEL EQUIPMENT CORPORATION

4401 North Ravenswood Avenue

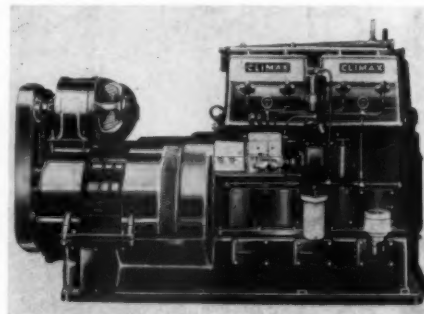
Chicago, Illinois

Climax Engineering Company Begins Production of Diesel Engines

THE production of two solid injection, compression ignition engines has just been announced by Climax Engineering Company of Clinton, Iowa. These prime movers are additions to the company's extensive line of Blue Streak gas engines, 8 to 480 hp., generating sets, 300 watts to 312 kva. and complete accessory equipment.

Both new engines are 4-cycle, full Diesels and intended for use as light plants and primary drives for pumps, compressors, mills, mine equipment, marine service, etc.

Model D148 is a two-cylinder unit with a maximum rating of 22 hp. It may be equipped for pulley drive with or without clutch or clutch and reduction gear or auxiliary power take-off. As a Diesel electric plant it may be direct connected, on a single base, with a 15 kva. generator.



The 4-cylinder Climax Diesel with 30 kva. generator on a common sub base.

Model D297 is a four-cylinder unit with a maximum rating of 44 hp. Drive equipment similar to Model D148 may be furnished. A special feature of D297, however, is that a flywheel, clutch, generator or marine gears may be installed on either or both ends, providing a radiator is not used. For electric power and light, the D297 may be used to power a 30 kva. generator.

Among the interesting features of these new Climax Diesels are: One piece crankcase and cylinder housing; replaceable chrome nickel iron cylinder liners; water cooled exhaust manifold; designed to make all parts accessible for inspection.

Philip J. Olin

THE Donaldson Company, Incorporated has announced the death of its Secretary and Treasurer Philip J. Olin on September twenty-fifth.

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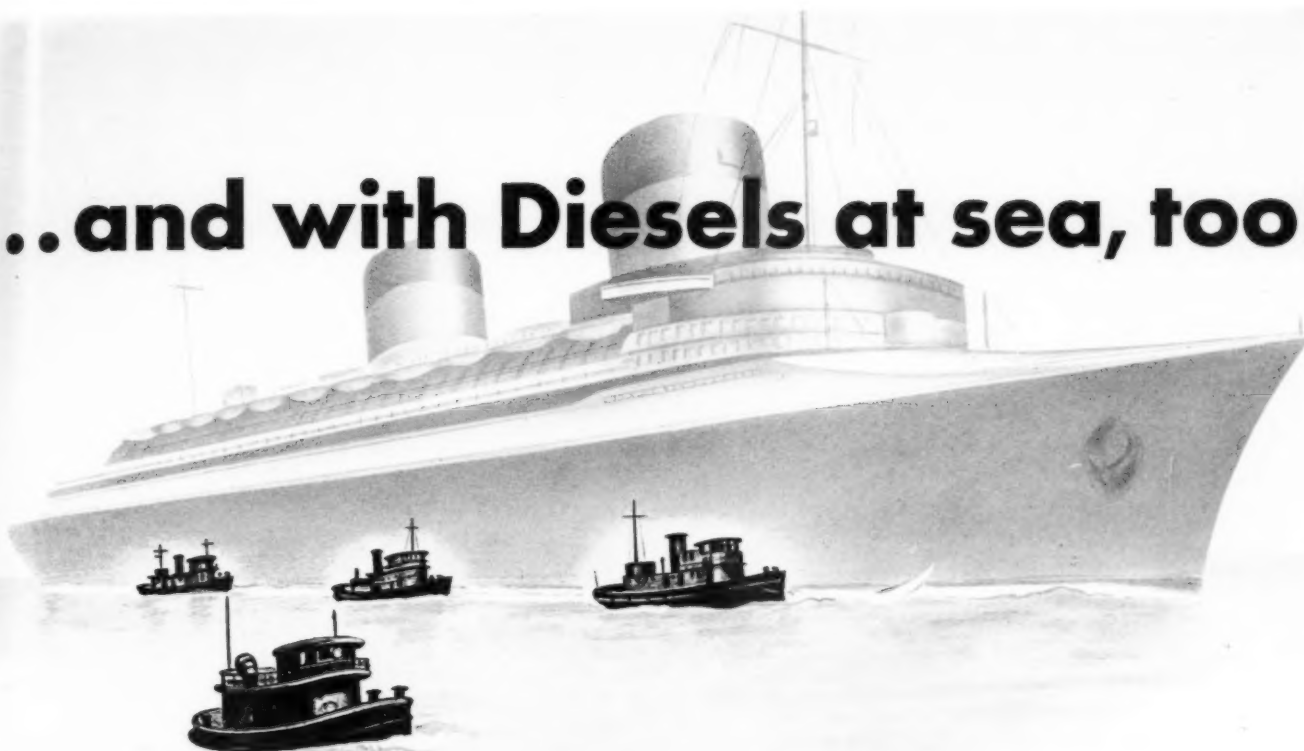
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...and with Diesels at sea, too!



McQUAY-NORRIS **ALUMINIZED** **PISTON RINGS**

In tugs, in mine sweepers, freighters, landing boats . . . wherever Diesels do their work at sea, in war or peace McQuay-Norris precision parts help them perform more efficiently, more economically. And not only at sea, but in every field of transportation . . . cars, trucks, tractors, airplanes,

McQuay-Norris parts have long been noted for their precision and stamina. Our 33 years' experience in making precision parts, our clinical research, our engineering and technical facilities, are being extended to the Diesel industry in an ever-increasing degree. Send us your blueprints.

McQUAY-NORRIS MFG. CO.

ST. LOUIS, MO.

PRECISION WORKERS IN IRON, STEEL, ALUMINUM, BRONZE, MAGNESIUM



Service Men of Fairbanks-Morse & Co. Remembered as Col. R. H. Morse Sends 1,500 Yule Packages

APPROXIMATELY 1,500 employees of Fairbanks, Morse & Co., who are serving the United States in the army, the navy, the marines and coast guard, are to be remembered with Christmas packages sent them by Col. Robert H. Morse, President and General Manager of the company.

"The men and women of the services are doing a grand job," Col. Morse declared, "and we are not forgetting them. About 1,500 of our employees now in the armed forces will have their gifts sent them this week. Those who are still within the confines of the United States will be sent the same packages a little later."

The packages weigh the limit as allowed by the postal authorities and include useful as



Col. Robert H. Morse, President of Fairbanks, Morse & Co., happily addresses gift packages to employees of the company now in the armed forces of the United States, as R. H. Morse, Jr., general sales manager, assists him. Both are veterans of the last war and realize what it means to the man in uniform to be remembered at Christmas time. They expressed pleasure in being able to send these packages to men at home and abroad. "Our wish is that they'll be able to be home soon," both men declared.

How Will Your Children Live?

That's easy! They'll live better than you just as certainly as you live better than your parents. American industry has put the car, the refrigerator, the radio and other conveniences within the reach of all. After the war, the three-plant facilities of the Weatherhead Company will be prepared to help you build these products again and—mark this!—many strange new devices which one day will make your life, and your children's lives, far safer and pleasanter in scores of ways.

Look Ahead with



Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO
Manufacturers of vital parts for the automotive, aviation,
refrigeration and other key industries.

Plants: Cleveland, Columbia City, Ind., Los Angeles
Canada—St. Thomas, Ontario

well as delectable items for which the men have expressed a desire. Among these are a full carton of cigarettes, two tins of krispy-krunch peanut brittle, a box of candy, a tube of shaving cream, tooth paste, a box of razor blades, soap, a deck of playing cards, bag of buttons and a sewing kit.

A beautiful Christmas card signed by Col. Morse is included which wishes the men good luck and God-speed wherever they may be until their present task is ended in a glorious victory and they return safely home.

Korfund Issues New Vibration Control Bulletin

THE Korfund Company, Inc. has prepared a simple but comprehensive and informative guidebook in color on the subject of Vibration Control as applied to both Stationary and Marine equipment. Twenty-four pages are devoted to Theory, Applications and Illustrations, including main propulsion engine installations. A complete guide is provided for the solution of vibration problems which arise in office buildings, industrial plants, and on board ship due to the operation of engines, grinders, hammers, punch presses, refrigerating and ventilating equipment, and other similar machinery.

The new Catalog G-100 is available upon written request to The Korfund Co., Inc., 48-15 32nd Place, Long Island City, New York 1, N. Y.

This Fuel Conservation started 15 years ago!

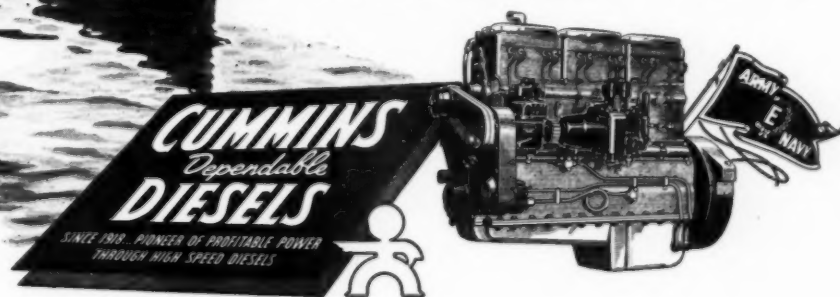


The principle of Fuel Conservation is to eliminate waste without sacrificing any vital need. For example:

In 1928, fire protection for its harbor was a vital need at Portland, Maine, but natural New England thrift rebelled against paying for fuel which would be consumed in idleness . . . in merely keeping up steam to assure having fire protection when it was demanded. After a thorough investigation, the fire boat, City of Portland, was ordered and Cummins Diesel power was chosen for three reasons: *First*, the Cummins Diesel's proved easy starting made certain that the boat would be ready to go any time, day or night. *Second*, the engine's compact size and light weight per horsepower made it an ideal plant for fire pumps and main propulsion. *Third*, the Cummins Diesel's recognized fuel economy and low maintenance assured a low operating cost.

In 15 years of duty on Portland's water front, and in comparable terms of service in fire boats at Chicago and Ketchikan, Alaska, Cummins Diesels have consistently demonstrated their ability to provide maximum protection at a minimum cost in dollars, manpower and fuel.

Such economy—multiplied by the many thousands of Cummins Diesels doing scores of jobs essential to a nation at war—becomes doubly valuable now when every dollar and every man and every drop of fuel is so vitally needed to push the fight on the battle front and the home front. CUMMINS ENGINE COMPANY, Columbus, Indiana.



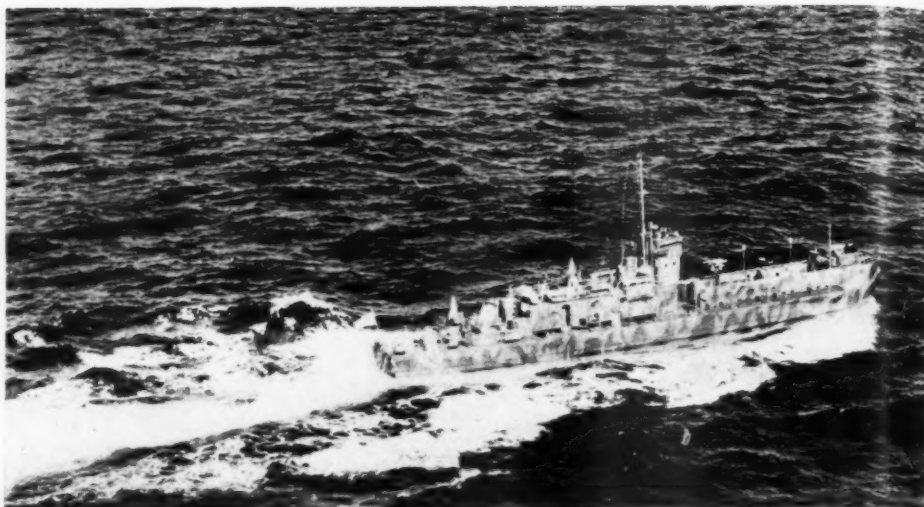
Invasion Craft Powered With Diesels, Navy Reveals

LANDING craft employed in the successful invasion of Sicily were largely powered by General Motors Diesel engines, it was disclosed in a telegram of congratulations sent yesterday by Rear Admiral E. L. Cochrane, USN, to the workers of the Detroit Diesel Engine Division of General Motors Corp. The engines referred to by Admiral Cochrane are two-cycle 71-series GM Diesels, which used singly and in different combinations of multiple installation, power Navy landing barges of various types and designs from the smallest to the largest of such craft.

In his messages from Washington, Admiral Cochrane, who is Chief of the Bureau of Ships, referring to the Sicilian campaign as the "largest invasion operation in history," said that the small number of casualties suffered in the actual landing was in a measure due to the reliability of performance of the GM Diesel engines which powered the great flotilla of landing barges.

Admiral Cochrane's telegram follows:

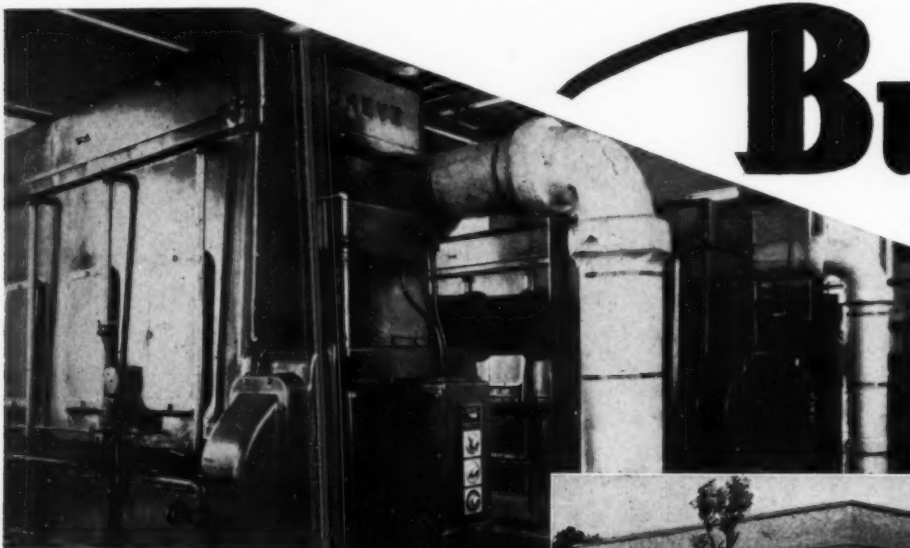
"To the men and women of Detroit Diesel Engine Division, General Motors Corp.



The smallest to the largest type (such as the LCI boat pictured above) of landing craft are powered by General Motors Diesel engines. In the Sicilian campaign, which he called "the largest invasion operation in history," Rear Admiral E. L. Cochrane declared reliability of Diesel power accounted for the small number of casualties.

"You will be gratified to know that a large majority of the invasion vessels which participated in the Sicilian campaign were powered by your Diesels. That this largest invasion operation in history was executed with a maximum of precision and a minimum of casualties was in no small measure due to the reliable power plants

supplied by you for our assault craft. All of you are to be warmly commended for your contribution to the victory. The Bureau is confident you will continue to produce to the utmost, in order that new landing craft awaiting your Diesels may be ready to play their part in the invasions to come."



Now in its third year, this Grayling, Michigan, generating plant—with three Buckeye Diesels—has given unfailing service, realizing a net profit of better than 30% of gross income; has reduced consumers rates 20%; and has earned a two-mill cut in the city tax rate.



Buckeye Diesels

FOR REAL ECONOMY

The records of Buckeye Diesel installations — everywhere — clearly show dependability and unusual economy — the inevitable results of Buckeye's distinctive features —

- ★ SILENT WATCHMAN
- ★ SEED WATCHMAN
- ★ FULL PRESSURE LUBRICATION
- ★ REVERSIBLE SHELL-TYPE SILVER ALLOY BEARINGS
- ★ COMPLETELY ENCLOSED

Plus Buckeye craftsmanship backed by 35 years' experience.

Engine Builders Since 1908

Be Profitwise and Dieselize with Buckeyes
THE BUCKEYE MACHINE COMPANY LIMA, OHIO

are powered
st invasion
accounted

All of you
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confident
utmost, in
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art in the

MY
ations
dability
results

ALLOY

by 35



War Workers with an enviable record

These Alcoa Aluminum pistons (the big fellows are two feet tall) were developed in prewar days for important tasks like hurrying streamliners across country. With such locomotives averaging 300,000 miles per year, these pistons established an enviable peacetime service record.

Came the war and Lynite pistons stepped right into war work. Today, they're in all kinds of fighting equipment, doing a real job under fire. Reports from many sources confirm the earlier findings on their

ability to take it. Lynite* pistons, made of Alcoa Aluminum Alloys, help provide smoother engine performance, higher efficiency and longer life.

And just as their difficult prewar assignments enabled Lynite pistons to attain their present high quality, so is their war work developing them still further. Another reason why, with the help of aluminum, your postwar Diesels are going to be better than ever. ALUMINUM COMPANY OF AMERICA, 2141 Gulf Bldg., Pittsburgh, Pa.



*Registered Trade Mark, Aluminum Company of America

LYNITE PISTONS
CAST OF ALCOA ALUMINUM



When Lights Must Not Fail — — Diesel Power Finds Work to Do!



Scene: an emergency field hospital on the invasion front; the critical point in a delicate operation; a boy's life is at stake! Light is an important ingredient in the surgeon's success or failure.

When lights must not fail — in the field, on ship-board, Diesel-powered auxiliary generators are entrusted with this important assignment, and Ex-Cell-O fuel injection pumps and nozzles are playing an important part in their stamina and dependability.

Ex-Cell-O fuel injection pumps are available in two types: type KD for use on engines which operate at constant speed, and for variable applications where automatic timing advance is not required; type KB automatically advances injection timing according to engine rpm, thus assuring maximum fuel economy and full power output at all speeds.

EX-CELL-O

F U E L I N J E C T I O N E Q U I P M E N T

Ex-Cell-O precision nozzles, available to Diesel engine builders for original equipment and replacement, combine simplicity with freedom from leakage and stickage, and protection for working parts. There are designs for various types of aircraft, automotive, marine, and stationary Diesel engines.



For complete details of Ex-Cell-O Fuel Injection Pumps and Nozzles, Diesel engine builders should write to Diesel Division of Ex-Cell-O Corporation, 1200 Oakman Blvd., Detroit 6, Michigan.

Continued from page 58 . . . on one of the connecting rods. Inspection showed that the pin had become defective and having none in stock they got in touch with the manufacturer who advised them that it would be several days before one could be gotten to them. The unit was badly needed, so they took a crosshead pin from a larger unit which was available, and turned it down to the proper size to fit the crosshead in question, doing all the work in a local machine shop. By so doing they kept the unit in operation with a minimum of outage over the week end, and without interruption to service on their load demand.

In still another plant, a unit lost a connecting rod bearing. Having no spare immediately available and being unable to procure one for several days, they devised a way of rebarbbiting the old one, then took it to a local machine shop and turned the bearing out to proper size and refitted it. This eliminated a longer period of outage and in a few hours the unit was back in service.

Necessity is the mother of invention, and a lot of the personnel of many of our smaller plants with limited facilities are now finding that when they are strictly up against some difficult problems they can do things, with a will and some good hard work, which they felt in normal peacetimes were beyond them and which they were incapable of accomplishing. This is the spirit that is taking the "Hit" out of Hitler, and with such a spirit, this nation can never be whipped.

So remember, if your plant is not flying an Army and Navy "E", your Government still is appreciative of your efforts, and the combination of these efforts will eventually bring victory.

Helpful Gasket Chart Available

AN up-to-the-minute Gasket Chart showing the cross-sections of 36 most popular Gasket Types, their purposes and the characteristics which fit them for the specific services intended. is now available to interested engineers.

This chart is featured in the second issue of "The Gasket"—a series of technical papers on gaskets compiled by the Research Laboratory of the Goetze Gasket and Packing Company, Inc., New Brunswick, N. J.

In requesting copies of this and succeeding issues of "The Gasket," write the company on your business letterhead, mentioning your position.

"TASK BEGUN ON ISLAND X"

THERE'S no salute of guns when the Seabees go in for a landing. No show of gold braid. Just a barge-load of men in dungarees, under a sea-toughened bosun's mate—tools and supplies. "Can do" is their motto.

They have a job to do and, regardless of difficulties, they have the resourcefulness to get it done. In days or weeks the base will be built and they'll move on.

One of the most important pieces of equipment that goes ashore with the Seabees is a "Caterpillar" Diesel Electric Set. It's *their* kind of a machine. Tough. Versatile. Dependable. Without fuss or temperament, it stays on the job, giving them the power they need for the saws and winches, the lights and radio.

"Caterpillar" Diesels have been in some strange places in this war, and have worked under still stranger conditions. When regular Diesel fuel was lacking, they have run efficiently on anything that was handy —

crude oil, coconut oil or aviation gasoline.

Rugged and compact, these power-plants-of-all-work can be flown to inaccessible spots by plane, and set down in a jungle where they go to work in a matter of minutes. And they've run night and day for thousands of hours with little attention and no repairs. Because "Caterpillar" Diesel units power so many kinds of equipment, from tractors and rock crushers to pumps and compressors, they can be serviced in remote outposts with a minimum of interchangeable parts.

Today the armed forces have first call on "Caterpillar" production. When victory is won, "Caterpillar" Diesel power will be ready to serve a vast range of potential peacetime uses. And the "Caterpillar" dealer organization, now making a vital contribution to the war effort in the maintenance of older machines, will be able to supply sturdy new "Caterpillar" Diesels.



CATERPILLAR DIESEL



CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

TO WIN THE WAR: WORK—FIGHT—BUY U. S. WAR BONDS!

Three Stars For The Fulton Sylphon Company

EMPLOYEES of the Fulton Sylphon Company, Knoxville, Tennessee, look proudly this month at a third star in their Army-Navy "E" pennant, awarded for sustained excellence in production of materials vital to the effort.

This company was one of the very first to win the combined Army-Navy "E" award and has remained out front consistently.

Christmas Remembrances for Standard of Indiana Employees In the Services

STANDARD Oil Company of Indiana on October 1 completed shipping 600 Christmas parcels to employees in the armed forces who are overseas. Parcels were later prepared for 2,400 other employees in military service who are at domestic bases. Standard also remembered employees in uniform last Christmas with packages.

This year the parcel for men includes cigarettes, chocolate bars, caramels and other candy; peanuts, toothbrush, toothpaste, razor blades, shaving cream, hair dressing and comb. For women cold cream is substituted for masculine items in the parcel.

In each parcel is a greeting card reading:

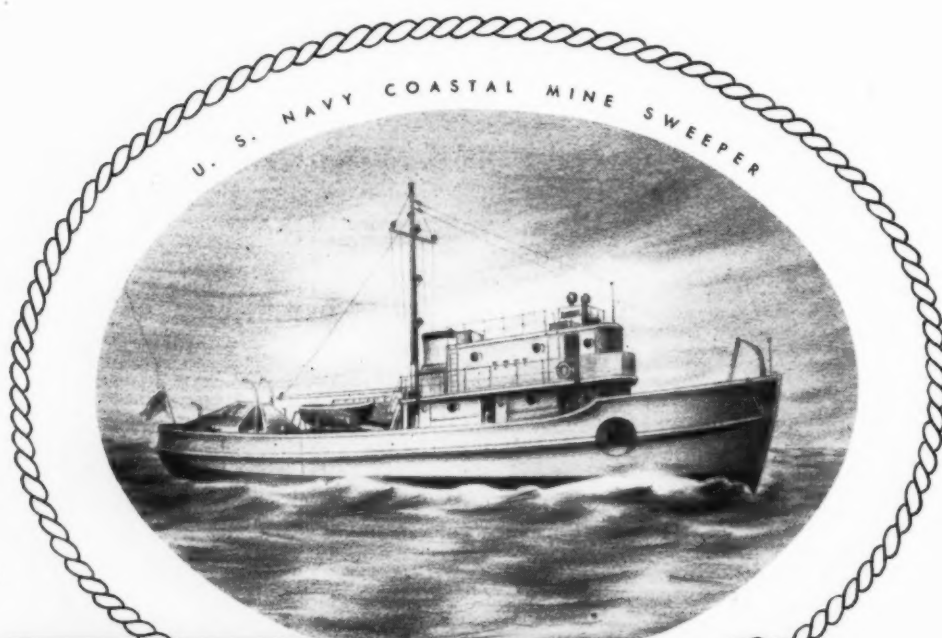
"Remembrance . . . To you who entered the armed forces from a job with Standard Oil Company of Indiana this package is a Christmas gift from your company. It is also something more; a symbol of the fact that you are much in the thoughts and good wishes of those of us who remain at work on the home front."

More Efficient Locomotives Foreseen After War— Diesel and Steam Locomotives Compared

ALTHOUGH the railroads have largely avoided new designs in rolling stock to conserve engineering manpower during the war, improved locomotives, including combustion-gas turbine and combined steam and mercury turbine types, are in prospect after peace comes. Lawford H. Fry, Director of Research of the Locomotive Institute, New York, recently said at a transportation session of the joint meeting of the Engineering Institute of Canada and the American Society of Mechanical Engineers.

"Improvements in steam locomotive design and economy are receiving most careful attention and will undoubtedly bear fruit eventually," Mr. Fry stated. "Advanced designs of water-tube boilers are on the drawing boards to reduce weight and produce steam at high pressures and temperatures. To utilize this, improvements in the steam distribution and expansion in cylinders must be made or steam turbines used so as to obtain all possible efficiency from the limited range imposed by the nature of things on any steam prime-mover. Possibilities also to be considered are the combustion-gas turbine locomotive, one of which has been built in Switzerland, and still further over the horizon is the possibility of a combined steam and mercury turbine locomotive which would cut water consumption in half and reduce greatly the fuel cost. . . .

"Motive power is supplied by the locomotives developed during the last ten years. The success of these is shown by the tremendously increased traffic handled. Net ton miles of freight per mile of road per day grew from 4,800 tons in 1940 to 8,100 tons in 1942. Passenger miles in May, 1943 were four times those of May 1941.



Guarding THE HARBORS THE DIESELS

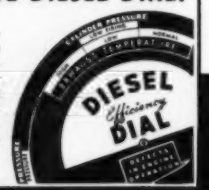
COASTAL MINE SWEEPERS guard our harbors and sea lanes by clearing away enemy mines and also by sweeping our own mine fields after they have no further use. The necessity of operating mine sweepers continuously makes imperative the need for uninterrupted motive power. To help provide dependable power, PREMAX Indicators are used to check compression and firing pressures of the Diesels that drive these sturdy auxiliary ships. Proper maintenance of cylinder pressures assures Diesel dependability.

The direct-reading PREMAX requires no skill, scale measurements, or calculations; gives accurate readings instantly at any engine speed. In the power, railroad, and transportation fields the PREMAX Indicator has long been established as an unfailing aid to efficient Diesel operation. Today—while continuing to serve industry—it also serves our Navy at war, helping to assure peak performance of Diesels in scores of fighting and auxiliary vessels of the United States Fleet.



FREE-UNIQUE DIESEL DIAL!

Automatically combines cylinder pressure and exhaust temperature readings to show instantly defects in engine operation. Furnished free while supply lasts. Write for one on your letterhead.



BACHARACH INDUSTRIAL INSTRUMENT CO.
7000 BENNETT ST., PITTSBURGH, PA.

ONLY BACHARACH BUILDS A COMPLETE LINE OF ENGINE INDICATORS

DEMCO

INDIVIDUAL NOZZLES



DEMCO Individual Nozzles present the latest design achievements known to the fuel injection field. They incorporate improved workmanship and the ultimate in precision. Modern manufacturing facilities of Demco guarantee the longest possible carbon-free operation and freedom from dripping.

Note these
DEMCO
Features

Demco Nozzles are interchangeable with other makes, providing unmistakable convenience and economy.

They are available in these all-inclusive sizes—shank diameters of .547 in., .700 in., .900 in.—a size for every diesel engine.

NO DELAYS! You will receive prompt delivery on all model DEMCO NOZZLES.

Write for complete information.

DEMCO

DIESEL ENGINEERING & MANUFACTURING CORP.
200-214 NORTH LAFLIN STREET • CHICAGO, ILLINOIS

"Electric, Diesel and steam locomotives are all contributing their part. Electric locomotives are restricted to special areas already electrified while the steam locomotives handling the bulk of the business, with the Diesel-electric prominent on a number of roads."

The paper compared steam and Diesel-electric locomotives. On the Santa Fe as of November, 1942, Diesel locomotives handled 7 per cent of the gross-ton miles of the system and 13 per cent of the passenger car miles, he said. Both steam

and Diesel have extended runs. In regular service engine runs of over 1,000 miles are scheduled for four trains daily operated by Diesel locomotives and for ten trains daily operated by steam locomotives. On such work, the Diesel locomotives average about 18,500 miles a month with a maximum of about 27,000, while the steam locomotives average about 12,400 miles with a maximum of about 18,600.

On the New York Central, steam locomotives take the passenger trains between New York

and Chicago, leaving in the evening and arriving in the morning and are ready for a return trip that evening. Mileage is about 20,000 to 24,000 a month.

In many cases efficient operation is provided by dual purpose locomotive which can handle both passenger and freight service. The 2,000 hp Diesel-electric locomotives on the New Haven were cited as an example. These make two round trips between Boston and New Haven daily, one trip in passenger and the other in freight service. The daily run of four times 157 miles is 628 miles and the monthly mileage is about 15,000.

The President Pays Tribute to the American Merchant Marine

ON the occasion of the recent dedication of the United States Merchant Marine Academy at Kings Point, Long Island, President Roosevelt praised the work of the Merchant Marine in our war effort and pointed the part this organization will play in the future of America's world commerce in the splendid letter reproduced below.

COPY

THE WHITE HOUSE
WASHINGTON

September 8, 1943

Dear Admiral Land:

Dedication of the United States Merchant Marine Academy at Kings Point, Long Island, New York, is a momentous forward stride in the nation's planned program of maritime progress. Not since enactment by the Congress of the Merchant Marine Act of 1936 has there been an event of greater import to America's world commerce—either in maintenance of our wartime lifelines or our future peacetime economy.

This Academy serves the Merchant Marine as West Point serves the Army and Annapolis serves the Navy.

We have the largest fleet of merchant vessels in our history. They are the finest ships on the seven seas. Our shipbuilders have become virtual miracle men. They are adding more than five new ships a day to our ocean-going merchant armada.

War has proved to the American people that a strong Merchant Marine, manned by courageous, capable, well-trained officers and crews, is as necessary to the nation as a powerful Army and Navy.

From this magnificent, modern educational institution thousands of America's young men will be graduated into service for their country in a calling of which they may justly be proud. Its finer traditions have been recorded in history than those of our seafaring men. They and their gallant ships laid much of the foundation on which our nation has grown to the America of today.

This Academy, a fitting monument to those past generations who have handed down so noble a heritage, will spur on present and future generations of our men of the sea to even greater achievement. It will equip them to be skilled navigators and engineers, worthy of the great vessels they will sail and of respect in every port throughout the world—men of whom all Americans will be proud.

To them and their ships our people pledge their confidence and support to the end that the American Merchant Marine shall truly befit a nation of our stature.

Very sincerely yours,

(Signed) Franklin D. Roosevelt

Rear Admiral Henry S. Land,
United States Maritime Commission,
Washington, D. C.

Carl Hussman Engineers Changes Name

CARL HUSSMAN—Engineers has announced a change in its firm name effective October 1 and will thereafter be known as Carl Hussman, Inc. with main offices and plant located at 3001-09 N. Oakley Avenue, Chicago 18, Illinois. The new firm will continue in the design and manufacture of equipment for the isolation of vibration and noise.



"Oiltransco", the sturdy new Diesel tug built in our busy yards, was recently delivered to Oil Transfer Corporation, New York, for Great Lakes, Canal and Coastwise movement of Oil to supply our fighting forces as well as Eastern War plants and homes. This 95 foot, 1025 hp. tugboat from the plans of George B. Drake, embodies many features evolved from the experience of her owners and executed to our high standards of materials and craftsmanship.



-KEEP THAT GUARD UP!



It is not all over but the shouting. * We can still
—lose. * Ships are yet to be launched that will
win the war. Planes are yet to be built that will
win the war. Bonds are yet to be bought that
will win the war. * Keep that guard UP, America!
This fight isn't over, yet. And a referee's decision
won't do. We've just got to win... by a knockout.

GENERAL MACHINERY CORPORATION

HAMILTON, OHIO

THE NILES TOOL WORKS CO.

THE HOOVEN, OWENS, RENTSCHLER CO.

GENERAL MACHINERY ORDNANCE CORPORATION

Army-Navy "E" To Briggs Clarifier

PRESENTATION of the first Army-Navy "E" in Montgomery County was made at 5 o'clock September 22, 1943 to the Briggs Clarifier Company at its plant in Bethesda, Md. by Rear Admiral C. H. Woodward, Chief of the Incentive Division of the Navy. Major General C. M. Wesson, former Chief of Ordnance, now Senior Assistant Administrator of the Office of the Lend-Lease Administrator in Charge of the Division for Soviet Supplies, presented award pins to representatives of the two plants and the main office. The award was accepted for the company by Southwick Walbridge Briggs, general manager, and Chase Donaldson, president. James Davie Roberge, works manager, accepted the "E" pins on behalf of the employees who were represented on the speakers platform by James Roberge for the Industrial Plant, Harrison Nichols for the Refill Plant and Georgia Regn for the General Offices.

In his address Admiral Woodward emphasized the importance of oil in modern mechanized warfare and the value of the oil filters which the Briggs Company designs and manufactures in conserving this vital fuel and in maintaining the engines of fighting ships. "The 'E'," Ad-



miral Woodward said, "has never been lightly regarded nor easily won and held in the fleet. Today the same policy holds true as the men in the fleet share their emblem with the men and women upon the production line. The fact that less than 2 1/2% of eligible war plants now

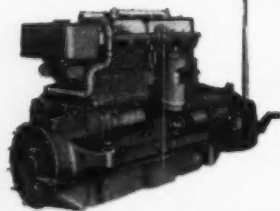
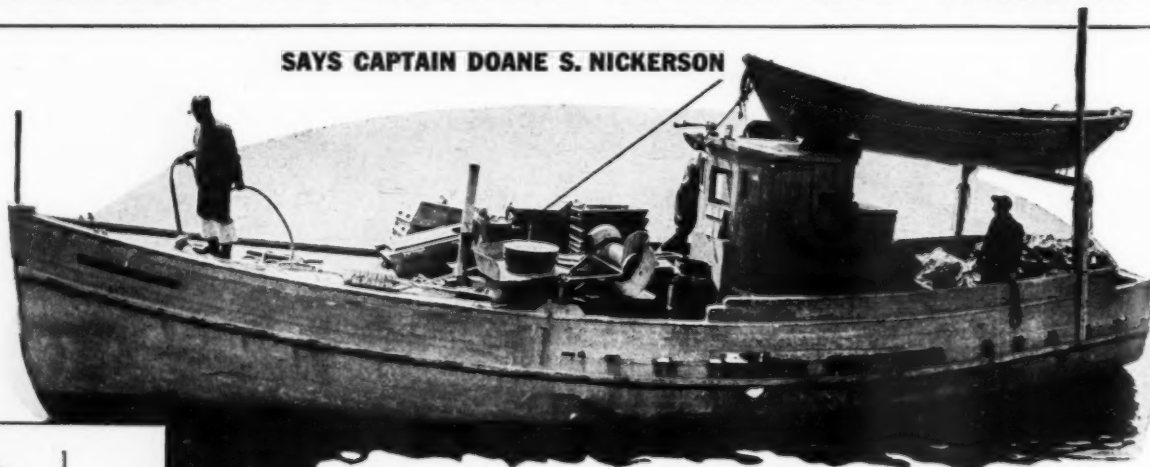
fly this coveted banner is proof that the 'E' is given only in recognition of outstanding accomplishment.

"Today," Admiral Woodward continued, "the Briggs Clarifier Company takes its place among

"I'M TICKLED TO DEATH WITH MY MACK"

SAYS CAPTAIN DOANE S. NICKERSON

The 42-foot Gloucester gill netter "Margie and Roy" is powered with a 457W, 70-hp. Mack Mariner Diesel. She is equipped with 3:1 reduction gear and a 36 x 24 propeller.



Mack DIESEL MARINE POWER

BUY U. S. WAR BONDS

Down Gloucester way, they'll tell you that the "Margie and Roy" is a humdinger of a gill net fisherman. And a big reason, both owner Captain Nickerson and skipper Captain Fenwick Larkin, will tell you, is the Mack Mariner that takes her out and brings her back loaded to the gun's!

With the record that Mack is piling up for dependability, stamina and over-all economy, you can't blame Captain Nickerson for being "tickled to death" with it. Scores of other skippers are just as pleased with the way *their* Macks are taking every day's job in stride!

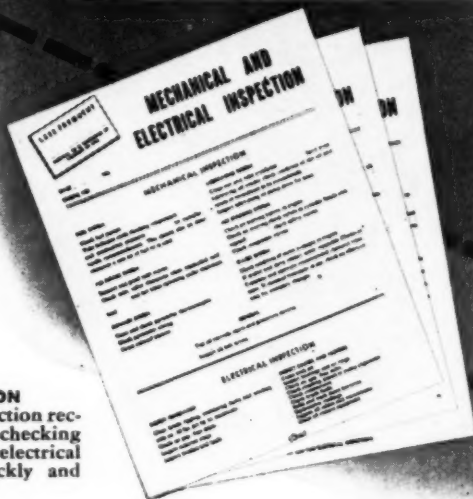
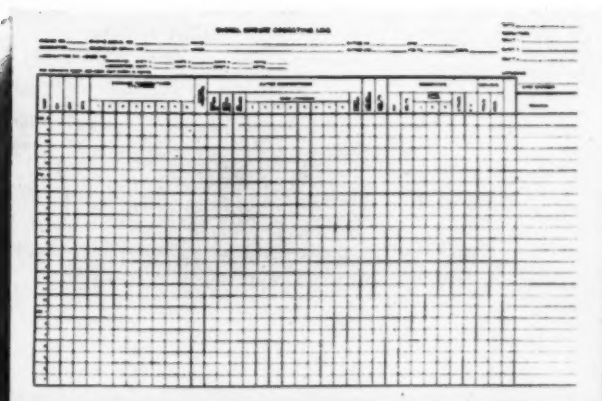
MACK MANUFACTURING CORPORATION
Marine Engine Division, Empire State Building, New York, N. Y.

MACK MARINE ENGINES ARE A PRODUCT OF THE BUILDERS OF WORLD-FAMED GASOLINE AND DIESEL-POWERED TRUCKS, BUSES AND FIRE APPARATUS

MAINTENANCE
Operating Log provides space for recording peculiar characteristics of each power generating unit—providing vital maintenance information.



OPERATION
Operating Guide gives practical operating precautions, check lists of electrical and mechanical equipment.



INSPECTION
Complete inspection record cards for checking mechanical and electrical equipment quickly and thoroughly.



Covers every angle

OF WARTIME DIESEL ELECTRIC OPERATION

See that the right men in your plant get this vital information NOW!

This practical plan provides operating men with wartime operation and maintenance information they need to get maximum kwh from your Diesel Electric plant.

See that the right men in your organization get this material *at once*. Insist upon the sys-

tematic inspection and maintenance methods outlined in the plan.

The Westinghouse Victory Maintenance Program is endorsed by leading manufacturers of Diesel Engines. Contact your engine builder now to obtain copies of this complete, practical maintenance program. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.
J-10256



Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

America's war production leaders. It is a reward richly earned, for Briggs contributions have been numerous—its production notable, both quantitatively and qualitatively speaking.

"Currently there are twelve Briggs workers for every member of your personnel in 1941. And per dollar shipments for half of that year are now exceeded in a single month's production. Nor has the enormous increase in production caused you to become careless of your craftsmanship. Rejections are still remarkably low

and I hope they will remain so."

Admiral Woodward concluded his speech with an unusual tribute to the fighting spirit shown by Briggs workers a year ago during the Potomac River Flood. "At that time," said Admiral Woodward, "you proved that you fully understood the importance of your production and the necessity for avoiding delay by working eighteen hours to remove equipment from flooded waters. Although machinery was in some cases ten feet under water, deliveries con-

tinued uninterruptedly. That is the spirit that wins wars. The men in the fleet would be proud to see that your determination matches their own."

Receiving the award flag for the company, Chase Donaldson, president and a veteran of the first World War, assured Admiral Woodward of the determination of every man and woman of Briggs to keep the "E" for which they had worked so hard. "We all know," he said, "that today is only the beginning of our fight. It's up to us now to prove that we can follow a good start by a strong finish."

In his citation General Wesson recalled his first meeting in 1930 with Mr. Briggs, founder of the company and inventor of its products. Keenly interested in the type of filtration developed by Mr. Briggs, the General ordered tests to be conducted at the Aberdeen Proving Grounds, as a result of which the company received its first government contracts. "It is," General Wesson concluded, "an unusual pleasure to see the Production Award conferred upon a company which I knew when it consisted of little more than an idea and the determination to make that idea work."

Pins were presented by General Wesson to James Davie Roberge, representing the Industrial Plant, Harrison Nichols of the Refill Plant and Georgia Regn of the General Offices. These representatives were chosen in elections held by Army-Navy "E" Committees at the three locations, Lonnie Lawson, Joseph Barton and William C. Ferguson, being chairmen.

Roper Corporation Earns Army-Navy White Star

THE Geo. D. Roper Corporation, Rockford, Illinois has received notification of its second Army-Navy war production award, the White Star. This emblem to be affixed to the Army-Navy "E" flag, presented to Roper over six months ago, is recognition of the fact that high standards of war production have been maintained.

Roper production consists of projectiles, ammunition boxes, pumps, air craft parts and other essential items for the Army, Navy, Maritime Commission and other services.

In keeping with the desires of the War and Navy departments, no formal ceremony will be held. Plans call for brief informal recognition of the occasion at a date to be determined soon.

WANTED

Advanced thinking Engineers

Today's headwork will be the deciding factor in tomorrow's competitive markets. That's why we address this advertisement to advanced thinking engineers who are concerned with the design, development and use of gasoline and Diesel engines.

We want these men to know all about the VISCO-METER*—the operating and selling advantages it adds to your product.

The VISCO-METER* is *not* a new development—*not* a war baby. As a matter of fact, the VISCO-METER* has been

in use since 1928. Fourteen prewar years have service-tested the VISCO-METER* on well known makes of gasoline and Diesel engines operating under every conceivable condition.

With America's entry into World War II, our government drafted VISCO-METER* production. This is further recognition of worth because several branches of Federal service had been using the VISCO-METER* for some years.

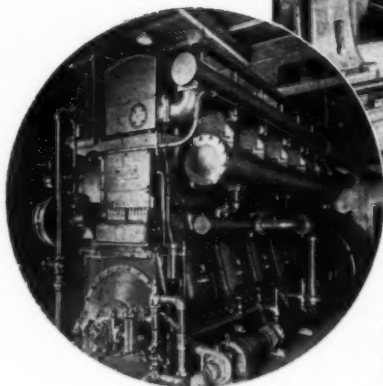
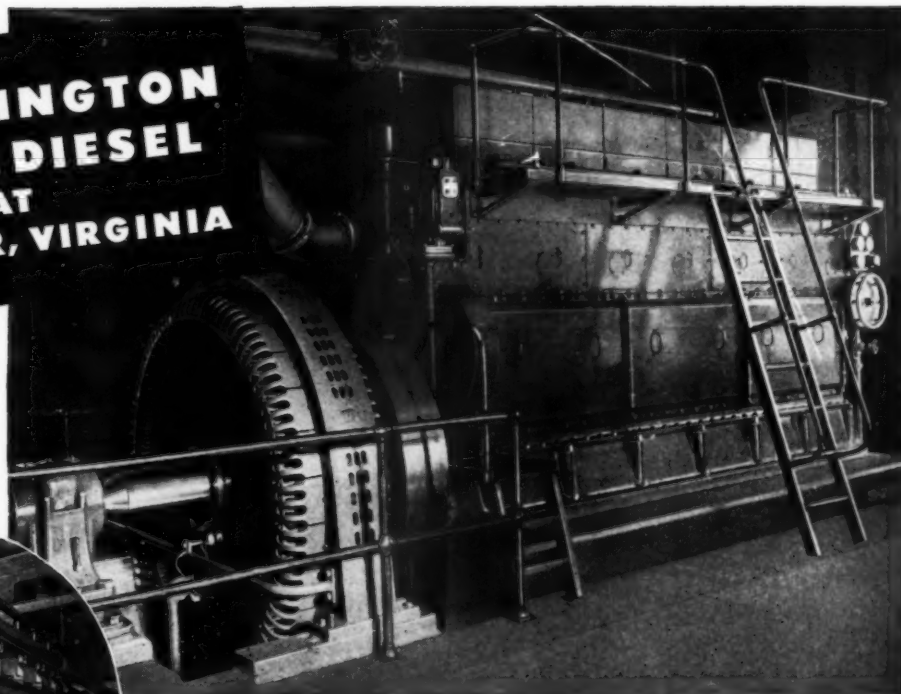
VISCO-METERS should soon be available for peace time engines.

We have prepared a brochure fully illustrating the operation of the VISCO-METER*. A copy is yours for the asking. In fact, a VISCO-METER* engineer will be glad to visit your office, without obligation, if you will telephone, wire or write:

VISCO-METER
CORPORATION GROTE ST., BUFFALO, N. Y.

*Fully covered by U. S. and Foreign Patents

WORTHINGTON 750-hp. DIESEL AT CULPEPER, VIRGINIA



To accomplish necessary expansion of, and further economies in, its power facilities, this forward-looking municipality . . . already experienced with diesel and other forms of power . . . selected a Worthington diesel after thorough investigation had brought out convincing records of maintained economy.

The thoroughly satisfactory performance of this installation is more than justifying the decision of those responsible for its selection.

Thousands of horsepower of Worthington engines . . . in Army and Navy bases, ordnance plants, industrial and municipal power plants . . . are now carrying important parts of the United Nations' war power load.

CONVERTIBLE GAS-DIESEL ENGINES

150 to 1500 hp.

DIESEL ENGINES

150 to 1500 hp.

GAS ENGINES

175 to 2880 hp.

WORTHINGTON AUXILIARIES
GIVE ADDITIONAL SERVICE SECURITY
THROUGH UNDIVIDED RESPONSIBILITY
OF ONE MAKER

Air compressors for starting

Centrifugal pumps for jacket water circulation

Evaporative coolers for jacket water cooling

Rotary pumps for fuel oil transfer

WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORPORATION • HARRISON, NEW JERSEY

. . . Continued from page 61 . . .
the letter, we will be glad to offer our suggestions as to how he may eliminate this trouble. However we may suggest, that the clogging is probably due to carbon deposits from the various stages of the compressor and suggest that he check the amount of compressor oil being used and also check the various stages of his compressor for leaks, etc. The blowdown lines may be too small or have too many fittings, etc., to allow for free passage of this material when you blow down these coolers.

The purpose of this department in taking up these various troubles and ways of improving conditions which bother in daily operation, is to offer suggestions by which these difficulties may be overcome. Therefore when writing in give the details in full and accompany your questions and letters with rough sketches so that we may obtain a comprehensive picture of the situation. This will not only help us but will bring in other suggestions from our readers who may have had similar problems.

DIESEL POWER PROTECTION



EASILY APPLIED TO OLD OR NEW ENGINES

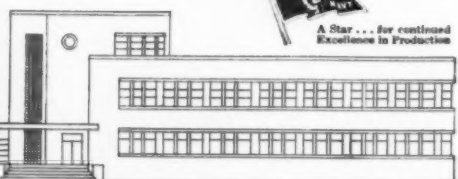
Penn Safety Controls provide dependable, low-cost protection against engine damage from oil or water cooling failure . . . prevent loss of production time so vital during the war emergency.

Many engine manufacturers are now including Penn Safety Controls as standard equipment. They are just as easily applied to old engines as to new. Penn controls sound a warning

alarm, light a signal light, or shut down engine operation, as desired, in time to prevent damage from either cooling system or oil failure.

For complete information, without obligation, about this vital engine protection, write now to obtain catalog with description and specifications. **Penn Electric Switch Co., Goshen, Ind.**
In Canada: Powerlite Devices, Ltd., Toronto, Ont.

Penn



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

Improving Trade Relations Between the United States and Other American Republics

THE rising tide of goodwill and resultant trade with our neighbors to the South is being effectively fostered and enhanced by a program of Commercial Standards sponsored by the U. S. Department of Commerce, through its Division of Trade Standards headed by I. J. Fairchild. That this splendidly conceived program was quickly accepted by our ever alert Diesel Industry is evidenced by the following excerpt from an article by Sarah C. Saunders, Industrial Projects Unit, Bureau of Foreign and Domestic Commerce which appeared in the August 28th edition of Foreign Commerce Weekly. Implementation of this program in the form of product label and acceptance blank are illustrated herewith.



Example of certificate attesting compliance with established standards.

CS102E-42	
ACCEPTANCE OF COMMERCIAL STANDARD¹	
If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.	
Division of Trade Standards, National Bureau of Standards, Washington, D. C.	Date.....
Gentlemen:	
Having considered the statements on the reverse side of this sheet, we accept the Commercial Standard CS102E-42 as our standard of practice in the production, labeling, and rating of Diesel and fuel-oil engines (export classifications).	
We will assist in securing its general recognition and use, and will cooperate with the standing committee to effect revisions of the standard when necessary.	
Signature of individual officer..... (In ink)	
(Specify capacities or print the following item)	
Name and title of above officer.....	
Organization..... (Full or partial name as it should be listed)	
Street address.....	
City and State.....	
<small>¹ Please file separate acceptance for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related business, having no record their general approval, the word "in principle" should be used after the signature.</small>	

The above mentioned article states in part:

"Prospects for improved trade relations and increased business between the United States and the other American Republics are being strengthened by the issuance of commercial



WHEN PLANES TAKE-OFF TO MEET THE ATTACK

• The alert sounds . . . and interceptors roar down the runway like rockets . . . rise to meet the attack in split-second formation. A movement of the pilot's hand, and whirling blades cut deeper into the air for a quick climb. This is no time for a variable-pitch propeller to fail.

Guarding the fluid on which depends the bite or "feather" of these variable-pitch propellers are Pedrick *precisioneered* sealing rings

. . . helping, in their way, to knock out the enemy on land, sea, and in the air.

Wherever the strategy of war demands unfailing power . . . in planes, tanks, jeeps, trucks, and PT boats as well as in trucks, tractors, and war-workers' cars . . .

Pedrick *precisioneering* is a guarantee of tension, dimension, and that all-important flatness good rings must have to seal power completely.

WILKENING MANUFACTURING CO., Philadelphia and Scranton, Pa.
In Canada: Wilkening Manufacturing Co. (Canada) Ltd., Toronto.

TO ENGINEERS WHO MAINTAIN AND DESIGN ENGINES

The power to win is in your hands. Guard against shut-downs by replacing with Pedrick *precisioneered* piston rings. You can rely upon Pedrick to deliver that extra power needed today as well as to lengthen the time between overhauls. You can also count on Pedrick for the correct piston rings to make the post-war engines you are designing operate more efficiently and economically. Write for our latest catalog which contains practical suggestions for today and the future.

ROME WASN'T LICKED IN A DAY
... BUY MORE WAR BONDS

Pedrick
precisioneered PISTON RINGS

standards in both Spanish and Portuguese, as well as English versions. Distribution of these standards in the languages of the other Americas is now being effected at an average rate of better than one a month.

"A commercial standard is a voluntary recorded agreement among producers, distributors, and consumers, as to terminology, types, classifications, grades, sizes, and use characteristics of manufactured products. Recorded standards form a means of better understanding between

buyer and seller. They set up a standard of quality below which a given product, if sold under this standard, must not fall.

"If, for instance, the manufacturers of Diesel engines, together with distributors and users of this product, agree on certain definitions, ratings, specifications, and requirements, without which no Diesel engine may bear a certain label, the written summary of these agreements, entered into voluntarily by the manufacturers under the leadership of the Division of Trade

Standards, National Bureau of Standards, is a commercial standard. There is such a standard originally issued in English and recently released in both Spanish and Portuguese. It bears the name 'Diesel and Fuel-Oil Engines (Experimental Classifications), Commercial Standard CS102B-42,' and it was issued by the National Bureau of Standards, Department of Commerce, in 1942. Conspicuous in the printed copy is the picture of a label which every Diesel engine conforming to this standard should bear. Thus any buyer of an engine bearing this label is assured that he is receiving standard quality."

These standards, containing interesting information on Diesel and Fuel Oil engines, are available from the Superintendent of Documents, Washington, D. C., at 10c each. Lists of the Standing Committee and the Acceptors are given on pages 23 and 27, respectively, of the bulletin.

Titeflex Appoints Gordon J. Wygant

MR. Gordon J. Wygant has been appointed Field Service Manager for the Titeflex Metal Hose Co., Newark, N. J. Mr. Wygant will supervise the servicing of Titeflex flexible tubing installations throughout the United States.



Gordon J. Wygant, Field Service Manager, Titeflex Metal Hose Company.

Before joining the Titeflex organization, Mr. Wygant was a member of the Engineering Department of the New York Trap Rock Corporation, and has also been engaged in the construction field as an advisory engineer.

AMERICA'S ONLY RADIAL
AIR-COOLED DIESEL ENGINE

MORE THAN HORSEPOWER
FOR TANKS, PLANES and SHIPS

No Fire Hazard	Dependable Operation	Lower Cost of Fuel
Lower Fuel Consumption	Instant Response to the Throttle	Constant Torque at All Speeds
Increased Striking Range	No Ignition System	No Radio Interference
Greater Stamina		

ESTABLISHED 1919  5-7

Guiberson U.S.A.
GUIBERSON DIESEL ENGINE COMPANY ★ THE GUIBERSON CORPORATION
Dallas, Texas Aircraft and Heater Division

... That ships can move Materiel-Munitions-Men

I AM PROUD TO FIGHT...

I began life as a 33,000lb. white-hot billet of fine steel. Forging Hammers and Presses, Heat-treating Furnaces, Machines and Men trained me down to fighting weight . . . around 10,000 lbs. ringside.

I drive Liberty Ships, Submarines, P-T Boats, the Diesels of War.

I am proud to fight for the United Nations . . .

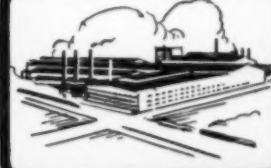
I was wrought, forged, seasoned and machined by expert designers, engineers and craftsmen at Erie Forge Company.

My counterparts..Shafting, Connecting Rods, Crankshafts, Steel Forgings and Castings..are good tough fighters for the battle of the Nations and for Industry.

THROW YOUR SCRAP INTO THE FIGHT



ERIE FORGE COMPANY, ERIE, PA.



New Oakite "Digest" Now Available

OF interest to Diesel engineers, superintendents and other executives responsible for power plant maintenance is a new, 16-page Digest just released by Oakite Products, Inc., New York.

Based upon the average successful experience of over 300 steam, internal combustion and central station plants, the Digest concisely describes 65 problems and jobs that commonly occur in

power plant maintenance. Various methods are outlined, materials and amounts used given, results obtained, and advantages gained. In addition to the many diversified types of work and operations discussed, such as degreasing, paint-stripping, salvaging and rust removal procedures, the manual contains many useful diagrams and hookups successfully being used for cleaning and de-scaling heat exchange equipment.

The Digest is prepared in data sheet form and

is indexed to facilitate ready reference. Write to Oakite Products, Inc., 22D Thames Street, New York 6, N. Y., for your copy.

Elliott Strainers for Marine Service

ELLIOTT Company Strainers for marine service are described in Bulletin A-10, an 8-page letter size brochure off the presses September 20th.

The construction and operation of Elliott Duplex and Macomb Strainers are detailed in this new bulletin. Duplex strainers, used for continuous service in fuel and lube lines, are described with an accompanying page of sketches and dimension tables.

More than a page of the bulletin is devoted to sketches and data on suggested nozzle arrangements for larger sizes of Macomb Strainers used in bilge, ballast and liquid loading service.

A section on strainer baskets is included, with perforation, mesh and velocity charts. Other Elliott marine equipment is summarized on the back cover. Copies of Bulletin A-10 are available upon request to the Accessories Department, Elliott Company, Jeannette, Pa.

Herbert W. Knapp

HERBERT W. KNAPP, Secretary and Director of Sales of the McQuay-Norris Mfg. Company, died suddenly from a heart attack on September 25th.

Mr. Knapp joined the McQuay-Norris organization in 1915 in a minor sales capacity, working the sparsely settled New Mexico and southern Colorado territories. He was later made a Branch Manager at Denver and moved from there to Kansas City. His next position with the company was that of District Sales Manager with headquarters in Omaha. Later, he assumed the District Managership of two districts and in 1928 he was made General Sales Representative for the entire organization. With the death of C. L. Derrickson, he became a director and officer of the company and his title was changed to Director of Sales.

Mr. Knapp was particularly active in the war effort, spending much of his time in Washington and Detroit working with advisory committees almost from the start of the war. He was a director of the Automotive Council for War Production. He was a member of the Board of Directors of N.S.P.A. and at various times during his career was active in industry-wide movements.



"CHICAGO SCREW"
Parts for Diesel Engines
are made to
Aircraft Quality Standards

In every theatre of war, "CHICAGO SCREW QUALITY" hardened and ground parts put "zip" and "go" into the engines of which they are a part. Manufacturers and users of diesel engines **know** that they can depend upon the fit, stamina, and performance of these accurately made parts.

We are specialists in the manufacture of Valve Tappets, Push Rods, Valve Spring Retainers, Connecting Rod Bolts, Studs and other related products—all to **Aircraft Quality Standards**.

Within our own plant, quality and accuracy are rigidly controlled throughout every step from rough stock to finished material. Tests and checks start in our modern metallurgical laboratory, and extend throughout all secondary operations such as slotting, milling, drilling, broaching, hardening, grinding, thread grinding, thread milling, etc.

Our customers find actual performance exceeds the claims advanced for "CHICAGO" Hardened and Ground Products.

Order from
your
distributor

THE CHICAGO SCREW CO.

ESTABLISHED 1872

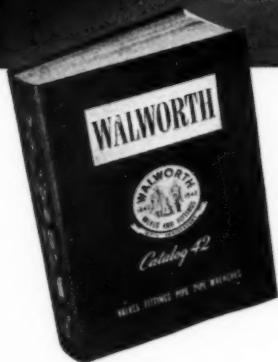
1026 SO. HOMAN AVENUE

CHICAGO, ILL.



**THE HAND
IS MIGHTIER . . .**

WITH A WALCO



You'll find pertinent information on Walworth's complete line of valves, fittings, pipe, and pipe wrenches in the new Walworth Catalog 42. Included are 78 pages of practical engineering data that simplify valve selection and make piping layouts easier. Write, on business stationery, for your free copy. Address: Walworth Company, 60 East 42nd Street, New York, N. Y., Department N 14.

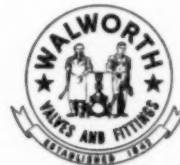
Every part of a Walco wrench is designed and built for strength and safety of operation. The Walco grips and holds no matter how hard you pull. All parts of this modern wrench are **made entirely of steel**. The handle and both jaws are made of drop forged steel. The housing and handle are forged from a single piece of steel. Both jaws are carefully machined, and all parts are heat treated to provide toughness, uniformity, and strength. The cross locked lower insert jaw, which is an exclusive Walco feature, makes it easy to remove a worn lower jaw and insert a new one. The spring may be quickly and easily replaced without the use of tools. These features prolong the life of the wrench indefinitely.

Users everywhere testify to the fact that Walco is the world's strongest wrench, the safest, and by far the least expensive to use. It is made by Walworth Company, manufacturers of valves and fittings for more than a century.



BOSTON WORKS
KEWANEE WORKS

WALWORTH
valves and fittings



**New Type All-Purpose
"Protectioneered" Motor
Announced by Fairbanks-Morse**

FOLLOWING months of research and practical operation in the field, Fairbanks-Morse has now announced a New type, All-Purpose, Continuous-Duty, Polyphase Squirrel-Cage Induction Motor for use in all kinds of industry.

This new motor is "protectioneered" and according to the company, embodies many special and vital features that will be viewed with ex-

treme interest by motor users everywhere.

Constructed with the widely recognized and exclusive centrifugally-cast F-M Copperspun Rotor, this new motor is fully protected against flying chips, falling particles, dripping liquids, and other industrial motor hazards. The ball bearings sealed in cartridge-type housings minimize expensive shut-downs due to bearing failures. Cross-flow ventilation, a feature in frames 224 to 365 inclusive, is obtained through protected inlets and exhausts

at each end of the motor—resulting in uniform cooling and the elimination of hot spots.

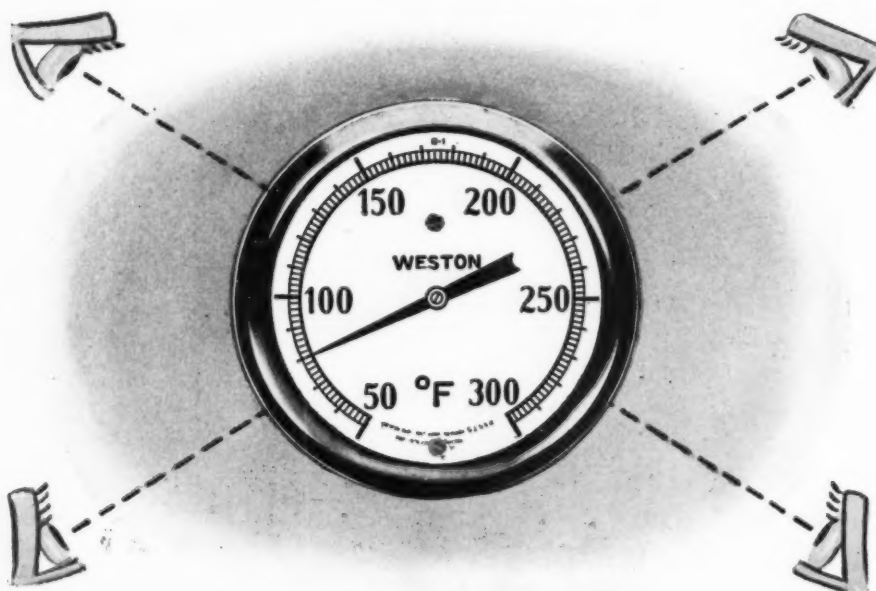


New Fairbanks-Morse Protected Polyphase Squirrel Cage Motor showing cross-flow ventilation—one of the many exclusive features of this new type motor.

Regardless of the position of the motor, complete safety for the operator is assured because there are no moving external parts. The frame is cast in one piece with rib sections to give added strength without increase in weight. The new motor also incorporates an innovation in conduit boxes. Where space is limited, the conduit can be brought up between the motor feet to the tapped hole in the motor frame and the conduit box cover assembled flush with the frame. The external box is then discarded. When the conventional conduit box is used it can be mounted in any one of four positions.

It is rated 40°C and designed to carry 115% load continuously without injurious heating (1.15% service factor).

Complete information and motor demonstration can be obtained by getting in touch with your local Fairbanks-Morse representative or by writing to Fairbanks, Morse & Co., Chicago, Ill. for Bulletin No. 1160 which features this new F-M motor.

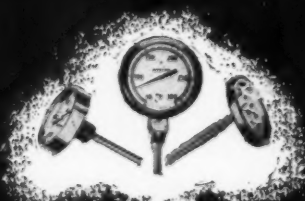


THE "EYES" HAVE IT...

The WESTON gauge-type thermometer is *far more readable*. But the big point is that *seein's believin'* whenever you read a WESTON. Because its high initial accuracy (1% over the entire scale) is maintained over long periods of time. The reason is... even the temperature element in the WESTON is all-metal! There is no gas, no liquids, no fragile parts. Thus it can withstand vibration or other mechanical abuse without damage or without affecting its accuracy. It's easier to install, too, and no corrections are necessary for capillary or elevation.

Booklet describing these rugged and dependable thermometers, including types, stem lengths, prices, etc., gladly sent on request. Weston Electrical Instrument Corporation, 579 Frelinghuysen Avenue, Newark 5, New Jersey.

Readability is only
one advantage of the
WESTON
All Metal
TEMPERATURE GAUGE



FOR VICTORY



**BUY
UNITED
STATES
WAR
BONDS
AND
STAMPS**

26 Alco-GE Switchers in September



E. V. BRADFORD, assistant superintendent of the Diesel shop, and W. S. Frame, assistant to the manager of the American Locomotive Works, congratulating foreman J. G. Knowlson (left to right above) as the 25th and 26th units of a record month's shipment of Alco-GE Diesel-electric switchers rolled away from the General Electric Schenectady Works September 30. Twenty other 1000-hp. locomotives like these for the New York Central and four 660-hp. switchers were completed in September for delivery to a number of railroads throughout the country.

Bacharach Develops Unique Diesel Efficiency Dial

THIS new device automatically combines cylinder pressure and exhaust temperature readings to show instantly defects in Diesel engine operation. It helps to simplify the interpretation of engine indicator tests. For instance, if the engine exhaust temperature is high with a normal cylinder pressure the calculator indicates that there is scaling of cylinder jackets.



The Diesel Efficiency Dial undoubtedly will prove to be a time saver for any Diesel engineer and a very practical aid for Diesel school instructors and students. While it is designed primarily for users of the many types of engine indicators made by Bacharach a quantity has been allotted for educational purposes and copies will be sent upon request while the supply lasts. Address Bacharach Industrial Instrument Company, 7000 Bennett Street, Pittsburgh, Pa.

New Peerless Pump Bulletin

IMPROVED methods of pumping water from deep wells are described in a new pump bulletin just issued by the manufacturer of Peerless pumps. Two basic methods of raising water are illustrated—the turbine and by hypocycloidal. The difference between oil and water lubrication is also shown. Interesting cross-sectional views of deep well pumps, revealing the shaft-

ing and submerged pump elements graphically demonstrate the operation of lifting water from any depth. Various types of pump heads are included, to illustrate application of power, for direct motor connection, belted drives, geared power and combinations of these. Readers interested in water pumping may obtain a copy of the bulletin by addressing Peerless Pump Company, 301 West Avenue 26, Los Angeles 31, Calif. Ask for Bulletin 141A.



... For Nugent Filters

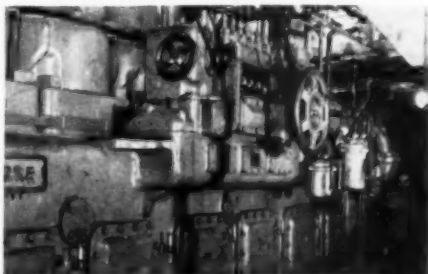
WHEN the Ohio River Company launched its new streamlined twin-screw Diesel towboat the *HENRY S. STURGIS*, Nugent Filters were aboard, ready to perform another vital wartime service.

The *STURGIS* is powered by two Fairbanks-Morse 7-cylinder Diesel engines which develop 805 HP. each at 300 rpm. These engines are equipped with built-in fuel oil transfer pumps which pump the oil from the main fuel bunkers to overhead fuel tanks,

pumping through Nugent Duplex Filters. The oil moves from the day storage tanks through another set of Nugent Filters to the injection pump reservoirs.

The selection of Nugent Fuel Oil Filters for this important installation is indicative of the dependability and efficiency of these Filters. Write Nugent today for a solution of your oil conservation problem.

WM. W. NUGENT & CO., INC.
415 N. Hermitage Ave., Chicago 22, Ill.



● Portion of one of the two main engines showing the Nugent Filters. Nugent Duplex Fuel Oil Filters provide twenty times more filtering area than most filters of comparable size. These rugged filters will remove particles as small as .0003" to produce 99.8% clean oil.

NUGENT FILTERS

SINCE 1897

for **THIS** battle, G. H. Q.

is at **YOUR** own desk!

★ Here's how you—yes, **YOU**—can carry out a smashing "pincer movement" against the Axis. Swing in on one flank with increased production of war goods! Drive in on the other with redoubled purchases of War Bonds through your Pay-Roll Savings Plan!

You're an officer in both of these drives. Your personal leadership is equally vital to both. But have you followed the progress of your Pay-Roll Savings Plan as closely as you have your production?

Do you know about the new Treasury Department quotas for the current Pay-Roll Allotment Drive? *Quotas running about 50% above the former figures?* You see, these new quotas are based on the fact that the armed forces need more money than ever to win the war, while the average worker has more money than ever before to spend. Particularly so, on a *family income* basis—since in so many families several members are working, now.

Remember, the bond charts of today are the sales curves of tomorrow! Not only will these War Bonds implement our victory—they'll guard against inflation, and they'll furnish billions of dollars of purchasing power to help American business re-establish itself in the markets of peace.

So get this new family income plan working at once. Your local War Finance Committee will give you all the details of the new plan. Act today!



This advertisement prepared under the auspices of the War Advertising Council and the U. S. Treasury Department.

LET'S KEEP ON Backing the Attack!

This Space is a Contribution to America's All-Out War Effort by

Rx Dr. Friedman



Editor—DIESEL PROGRESS

New R
for Hip
AN all-b
a pressur
has a cap
by the BL
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Ship Star
is being f
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New Rotary Hand Pump for High Pressures

AN all-bronze rotary hand pump, that develops a pressure of 125 pounds per square inch and has a capacity of 1.5 gpm., has been designed by the Blackmer Pump Company, Grand Rapids, Michigan. The new unit, known as a "Dead Ship Starting Pump" is now in production and is being furnished to the U. S. Maritime Commission. It is also used for other high-pressure hand pump applications aboard ship, such as handling certain types of lube oils and fuels.



New Blackmer all bronze high pressure hand pump.

According to J. B. Trotman, General Sales Manager of the Blackmer Pump Company, this new high pressure hand pump has, in addition to its marine uses, a number of industrial and commercial applications, chiefly in connection with hydraulic control devices and other equipment where high pressure, hand-operated pumping units are required. The new pump will therefore become a standard unit in the Blackmer line of rotary hand pumps.

Silver Babbitt Helps Win the War

WHEN the history of this war is written, one of its most exciting chapters will be industry's quick conversion to new materials, to replace those no longer available. Behind industry's doors, there is turning up every day some new discovery that is revolutionary but little talked about.

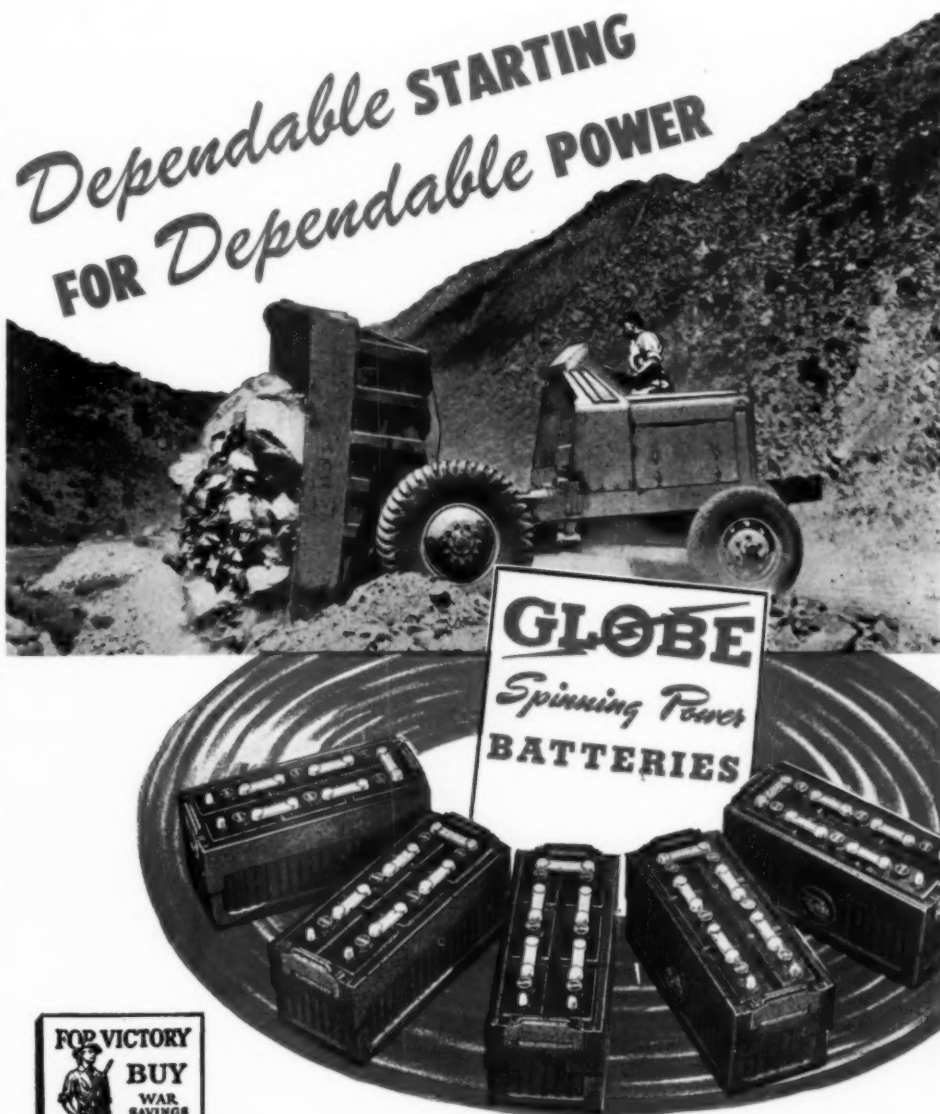
The creation of Silver Babbitt, for instance, is a direct outgrowth of the shortage of tin,

due to the war. The Battelle Memorial Institute of Columbus, Ohio, deserves credit for exhaustive research to find a Babbitt metal that is comparable to tin-base Babbitts. The ideal was to create a Babbitt that would have the same bondability and corrosion resistance as that of tin-base Babbitts and which would retain its hardness at operating temperatures without squeezing out. The answer was found in silver alloyed with a properly balanced lead

base Babbitt.

This new Silver Babbitt Metal, is now produced by National Bearing Metals Corporation, St. Louis, Missouri, with the authorization of the Battelle Institute. Engineering briefs and a bulletin have been prepared by this company. If you write to their department 0-9 you will receive free of charge detailed information on this new and important product.

*Dependable STARTING
FOR Dependable POWER*

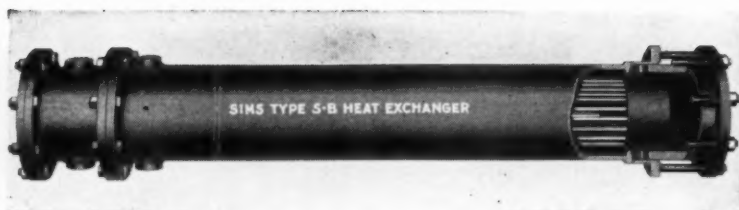


Doing the world's heavy work in remote sections, far removed from ordinary sources of service, the dependable Diesel engine is no better than the dependability of its starting equipment. That is why so many operators with electric starting Diesels look to Globe Spinning-Power Batteries with patented Perma-Set plates for long, uniform, unfailing performance. • A Globe engineer will be glad to analyze your needs — without obligation. Write nearest factory.

GLOBE-UNION INC., Milwaukee 1, Wis.

ATLANTA • BOSTON • CINCINNATI • DALLAS • KANSAS CITY
LOS ANGELES • MEMPHIS • MINNEAPOLIS • PHILADELPHIA • SEATTLE

DP-1143



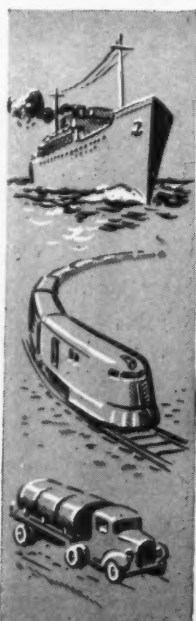
Investigate SIMS Jacket Water Cooling

• It is no longer a question of whether it is good economy to protect a costly and very busy Diesel Engine with fool-proof jacket water cooling. Today it's most important to select an experienced heat exchanger manufacturer, and so we point to our fifty-seven years in the design and construction of thousands of heat transfer units. The application is as important as the equipment. Consult Sims engineers.

WRITE FOR BOOKLET



A SPUR TO INGENUITY

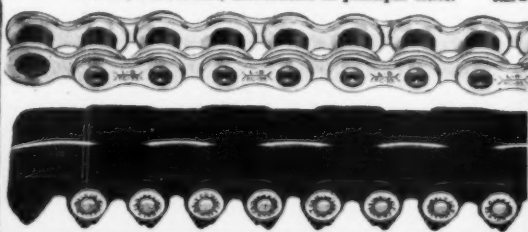


Day-by-day experience in every field of use is proving the many advantages of chain drives on Diesel engines. Their efficiency, flexibility, smooth operation and long life carry weight with builder and user alike. Link-Belt Company, with unsurpassed productive facilities and knowledge drawn from all industry, stands ready to aid both groups, in securing greater efficiency from present designs and in realizing the further possibilities of the Diesel engine.

You are invited to consult Link-Belt engineers freely, on any application of chain.

LINK-BELT COMPANY

Indianapolis 6, Chicago 9, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto: 8
Offices, warehouses, distributors in principal cities.



LINK-BELT Diesel
CHAIN DRIVES
SILENT AND ROLLER TYPES

Manual on Accounting and Control Offered by Cooper-Bessemer

AN instructive booklet entitled, "Accounting and Control Manual" has been prepared by The Cooper-Bessemer Corporation, 110-year-old engine and compressor builders, which summarizes the successful methods used by this manufacturer to control operations in their plants at Mount Vernon and Grove City.

Originally compiled to acquaint their own employees with various departmental functions, the regulation of which enables management to assure continued profitable production of the company's products, this attractive 45-page booklet is now offered to others as an educational aid in furthering their knowledge of principal methods and procedures essential to plant operation.

In commenting on the motive which prompted publication of this valuable data, the author, James E. Brown, chief accountant at Cooper-Bessemer's Grove City plant, stated that the realization that supervisors lack time these days to more than instruct in the operation of their own departments, was a chief factor.

Subjects covered in the manual include operations of the company's machine shops, foundries and assembly floors, with detailed descriptions of the methods used for controlling engineering design, ordering recording and storing materials, purchasing, timekeeping and inspection, production, payroll and inventory, and all other departmental activities associated with the fabrication and distribution of the company's products.

A comprehensive flow chart of standard costs and variances is included as well as a glossary of office, shop and product terms and principal part designations for their Diesel engines, gas engines, and Type GMV compressors.

Individuals or groups interested in obtaining a complimentary copy of this "Accounting and Control Manual" should write direct to The Cooper-Bessemer Corporation, Mount Vernon.

Marine Deaerating Heaters

ELLIOTT Marine type deaerating feedwater heaters are the subject of the recently published 4-page Bulletin N-14 released by the Heat Transfer Department, Elliott Company, Jeannette, Pa. Copies are available.

A cutaway view of a typical Elliott marine type deaerating feedwater heater is a fea-

ture of this bulletin. The operation of the heater is illustrated in detail in an accompanying drawing.

A page of description of special construction features is included. The heating spray nozzle, deaerating element, shell, and vent condenser are fully described in this section.

West Coast Diesel News

By JIM MEDFORD

THE decision of the Government through applications to Area Fisheries Coordinator to permit the building of new 70-foot plus fishing vessels has been met with prompt statement by the Enterprise Engine and Foundry Co., San Francisco, California, that they will construct promptly 24 six-cylinder Diesels suitable for these boats.

MARY GAIL II, new all steel unit of the Tide Water Transportation Co., Seattle, Washington, will be powered with a pair of Cooper-Bessemer Diesel engines.

FAIRBANKS-MORSE 600 hp. Diesels are the main power of the new army tug recently launched by Hofgson, Greene and Haldeman, Long Beach, California. She is the fifth 126-foot tug to be launched from this yard.

SHEPHERD Diesel Marine, Los Angeles, California distributors, announce the sale of nine six-cylinder, 100 hp. Caterpillar Diesels to Lynch Shipyards, San Diego, for use as auxiliary power on tuna clippers. They drive Fairbank-Morse generators.

COOPER-BESSEMER Corporation of Mt. Vernon, Ohio, has opened its third Pacific Coast factory branch office in the Russ Building, San Francisco. C. R. Jones is district manager, and John G. McKissick is in charge of the new office.

AT Terminal Island, California, a 200 hp., 5-cylinder Fairbanks-Morse Diesel has been installed in the 72-foot W. F. Wood of Tony Marincovich by Garbutt and Walsh. Ross heat exchangers, Burgess exhaust snubbers are part of equipment.

ANOTHER Superior 100 hp. Diesel of the marine type has been installed in a unit of the Newport Harbor, California, fleet, the 50-foot Zarac.

VAN Camp Sea Food Co., Terminal Island, California, has purchased another Caterpillar V-8 135 hp. Diesel for installation in a 70-foot

seiner. The wheel is a 57 by 45 Lambie and the reduction and take-off are Twin Disc.

DIRECT connected to a General Electric generator, a 70 hp. Atlas Imperial Diesel has been purchased by the Franco-Italian Packing Co., for installation in its 100-foot clipper Magellan, San Pedro, California.

"YANKEE MAID," 56-foot trawler and seiner owned by Dick Hanson of Seattle, Washington,

has gone into commission with her new 115 hp. Caterpillar Diesel. Exide batteries are also installed.

DONALD HANSEN'S 68-foot seiner has been completed by the Harold Hansen Yard, Seattle, Washington. Her power is a 110 hp. Atlas Imperial Diesel.

RATED at 150 hp., a new supercharged Cum-

Continued on page 97

CONTINUE TO PROTECT YOUR ENGINES

When Servicing Your Filters Insist on Genuine MICHIANA Elements

With conserving of critical metals still important, it is your job to prolong the life of your engines. With man shortage still more acute, the need for insuring maximum dependable engine performance is more urgent than ever.

To be sure of dependable engine performance,—to reduce needless

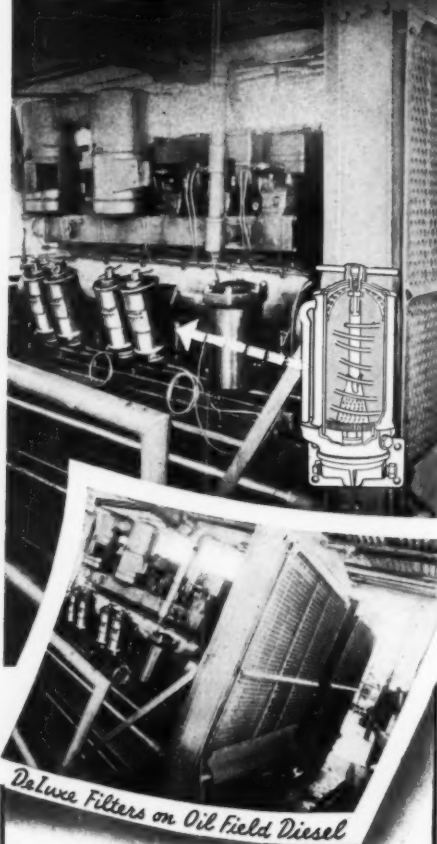
shutdowns and repairs,—always replace the filter elements of your MICHIANA Oil Filters with genuine MICHIANA Elements,—designed expressly for these filters. No other Elements have the high dirt-absorbing capacity provided by MICHIANA Wastex filtering material. MICHIANA PRODUCTS CORPORATION, Michigan City, Ind.



No. 17050 (163HP) Filter with single Element. This standard Element is employed in groups for filters up to 3266HP. When making Element replacements, you can be assured best results by using genuine MICHIANA Elements.



Equally Effective
for *Either Regular*
or *Detergent Oils!*



FOR regular oil, the Controlled Depth method employed in the DeLuxe Filter removes asphaltene and other contaminants, *before* they can combine into sludge and other harmful formations. For Detergent Oils, this method provides the absorption necessary to remove the minutest particles diffused by the additives. In either case, only DeLuxe can do a *complete cleansing job*, because DeLuxe alone has all eight construction features necessary for continuous cleansing. If you are a diesel operator, whether in the industrial, transport, or marine field, you will want the full facts on these features. Write for a Free Copy of "The Key To Clean Lubrication". DeLuxe Products Corporation, 1416 Lake Street, La Porte, Indiana.

DELUXE
OIL FILTER

DOES MORE THAN STRAIN OIL
MORE THAN FILTER OIL

Actually Cleanses Oil!

Wat-R-Miser Evaporative Condensers Now Equipped With Built-In Air Filter

EVAPORATIVE condensers with built-in air filters to protect against impurities in the cooling system, are now available in the new Wat-R-Miser line of Drayer & Hanson, Inc., Los Angeles, California, manufacturers of Heat Exchange Equipment. Wat-R-Miser units effect heat transfer by means of water evaporation in a continuously moving airstream. They are adaptable to a wide variety of industrial applications such as cooling batch quenching fluids, cooling oil for large Diesels, cooling jacket water, etc. Pitched tube condensing coils, a feature of the Wat-R-Miser, insure smooth, rapid, unrestricted flow of liquid by gravity, allowing full use of all the tube surface for condensing gas. Some other advantages of the pitched coil method are lower head pressure, smoother operation, lower power cost and increased overall refrigerating effect.

The manufacturer points out that proper filtering of the air eliminates or greatly reduces four important up-keep problems—clogging of lines due to impurities in the system, plugged spray nozzles, excessive head pressures and pump maintenance.



The Wat-R-Miser evaporative condenser now equipped with built-in air filter, seen in this view, and pitched coils both of which are exclusive features.

The new air filter is standard equipment on all models, which cover the full range of pop-

REINER
Made to Order



REINER Diesel Marine
Auxiliary Unit.

**MARINE AUXILIARY
DIESEL POWER UNITS
and GENERATING SETS**

REINER'S specialty is studying auxiliary service requirements and then assembling selected standard units into one composite unit capable of carrying the entire load.

That such a specialty is more than welcome in marine circles is evidenced by the steady stream of orders for REINER Units received from all over the country.

JOHN REINER & COMPANY

12-12 37th AVENUE, LONG ISLAND CITY, N. Y.

ular sizes from capacities of five to 100 tons. Model designs have been modernized to incorporate this new and exclusive development, and to provide improvements in compactness and efficiency.

The filter is all metal, yet rust proof. Construction is such that it may be removed easily and washed or cleaned when necessary. Full information, including 16 page catalog illustrated in colors is available upon request to the manufacturer—Drayer & Hanson, Inc., 738 East Pico Street, Los Angeles, 21, California.

Continued from page 95

mins Diesel has been installed by Van Camp Sea Food Co., in one of its larger tuna boats fishing out of San Pedro Harbor, California.

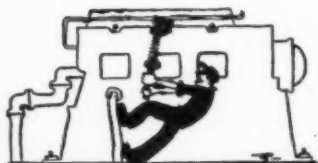
SOMETHING new in Diesel fishing boats is the advent of old MacMillan Arctic Expedition 80-foot schooner *Sachem*. Built by Alden, she is repowered with a Caterpillar Diesel by Shepherd Diesel marine and will trawl off the Mexican coast. New owner is Mrs. Lelia Eastman.

BY the way it was Gray Marine Diesels that powered the first landing boats on Kiska Island in the Aleutians, Alaska, August 15th, 1943. They've been doing a good job in the Mediterranean and South Pacific areas, too. They're the 71-GM 2-cycle type, converted for marine service by Gray.

ONE of the largest portable Diesel driven Gardner-Denver slush pumps, truck-mounted and powered with a pivoted Caterpillar 115 hp. Diesel, weighing 40,000 pounds is nearing completion by Shepherd Diesel Marine for Gibson Oil Company, Los Angeles, California.

LATEST type of army tug to go under construction is the 72-footer being built by the Pacific Boat Building Co., Tacoma, Washington. This is a single screw for harbor service with a pair of 350 hp. Fairbanks-Morse Diesels for main power.

AT Port Blakely, Washington, The C. O. Davis Company is building a 60-foot trawler for Matt Mathuson. The main engine will be a 75 hp. Atlas Imperial Diesel.



Latest Diesel Patents

A description of the outstanding patented inventions on Diesel and Diesel accessories as they are granted by the United States Patent Office. This information will be found a handy reference for inventors, engineers, designers and production men in establishing the dates of record, as well as describing the important Diesel inventions.

Conducted by C. CALVERT HINES

2,314,137

DIESEL FUEL

Everett W. Fuller and Edwin M. Nygaard, Woodbury, N. J., assignors to Socony-Vacuum

Oil Company, Incorporated, New York, N. Y., a corporation of New York

No Drawing. Application October 30, 1940,

Serial No. 363,493

14 Claims. (Cl. 44-57)

1. An improved Diesel fuel having in admixture therewith from about 0.1 per cent to about 5 per cent of an organic hydroxylamine, consisting only of carbon, hydrogen, oxygen and nitrogen, in an amount sufficient to improve the ignition quality of the fuel.

2,313,320

PISTON

David Bushby, Regina, Saskatchewan, Canada, assignor to The Vacuum Air Pressure Company



ECLIPSE

SEAMLESS FLEXIBLE METAL HOSE

Eclipse Seamless Flexible Metal Hose, manufactured of selected alloys and specially heat treated, is light-weight and durable. Wherever hose connections of these characteristics are needed—there is an ECLIPSE product to meet the conditions.

- ★ Water Cooled Exhausts
- ★ Alfol Insulated Dry Exhausts
- ★ High Temperature Flexible Exhaust Connections
- ★ Single Seamless Welded Steel Hose
- ★ Braided, Reinforced, and Armored Hose



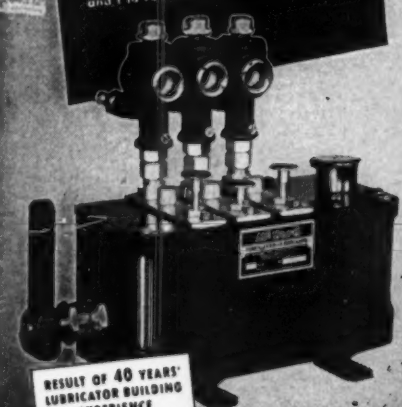
Write Dept. 24 for complete bulletin.



ECLIPSE AVIATION
SEAMLESS FLEXIBLE METAL HOSE
MANUFACTURED AND SOLD BY
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Class S.F.
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A modern lubricator for modern service on Diesel, gas, steam engines and compressors. Supplies dependable cylinder lubrication in metered quantities reducing friction and wear. Capacities: 2 to 24 pt. and 1 to 16 feeds. New catalog on request.



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DETROIT, MICHIGAN
LUBRICATOR DIVISION

Highest Quality Gaskets & Oil Seals

by **FITZGERALD**

Gasket Craftsmen
for 37 Years

Gaskets of all types and materials to give reliable service under all Diesel operating conditions.

For full information write ~

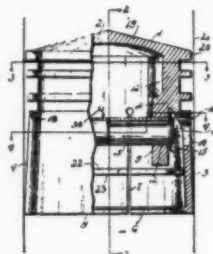
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COMPANY**

TORRINGTON, CONN.

Branches: Chicago, Illinois, Los Angeles, California
Canadian FITZGERALD, Limited, Toronto

FITZGERALD
GASKETS

Limited, Regina, Saskatchewan, Canada
Application June 14, 1940, Serial No. 340,605
6 Claims. (Cl. 309-11)

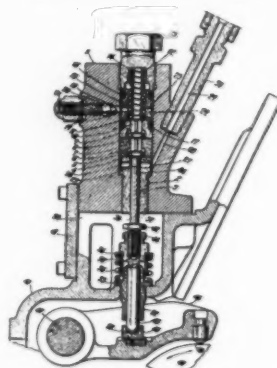


1. A piston body characterized by the provision of a skirt circumferentially tapering outwardly from a transverse plane medially of the length thereof, a pair of aligned, spaced diametrically disposed, annular, downwardly depending, piston pin bearings within the hollow interior of said skirt and spaced therefrom, said bearings being secured to said body at the upper parts only.

2,310,350

VALVE FOR FUEL INJECTION SYSTEMS
Charles M. Bovard, Mount Vernon, Ohio, assignor to Cooper-Bessemer Corporation, Mount Vernon, Ohio, a corporation of Ohio
Application September 30, 1939, Serial No. 297,249

6 Claims. (Cl. 277-42)



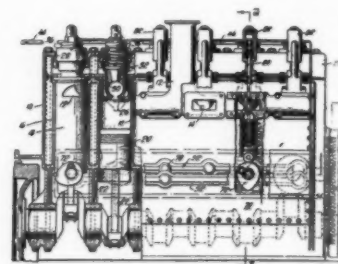
1. In a liquid fuel injection system for internal combustion engines: a fuel inlet, a fuel outlet and a valve passage therebetween, a plurality of independently seating disc valves and associated valve seats arranged serially in said passage, means for simultaneously seating and unseating said valves including interposed valve spacers, a pressure-actuated relief valve adjacent said outlet, and means maintaining said relief valve in resilient engagement with one of said disc valves when seated for permitting actuation thereof when said disc valves are seated, by pressure in said outlet exceeding a preselected value.



Uncle Sam's 110-ft. SC's and Diesel-powered Navy Tugs. Thereafter, let us show you 5-Star performance.

JOHN TRUMPY & SONS, INC.
formerly MAHIS YACHT BUILDING CO.
GLOUCESTER CITY, NEW JERSEY

2,311,693
INTERNAL COMBUSTION ENGINE
Edward T. Rodgers, New York, N. Y., assignor to Rodgers Diesels Corp., New York, N. Y., a corporation of Delaware
Application December 12, 1939, Serial No. 308,859
2 Claims. (Cl. 123-81)

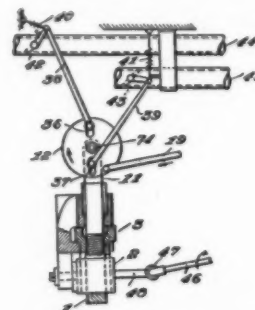


1. In a Diesel engine, a plurality of cylinders, a plurality of respective sleeve valves, a plurality of respective fuel injector pump pistons, and respective means for oscillating and reciprocating each of said valves, said oscillation and said reciprocation being simultaneous, said means being also in the form of a cam for reciprocating said fuel pistons.

2,314,926

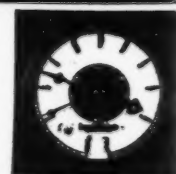
FUEL FEEDING DEVICE FOR INTERNAL COMBUSTION ENGINES
Rudolf Egli, Zurich, Switzerland
Application February 12, 1940, Serial No. 318,653

2 Claims. (Cl. 137-144)



1. A fuel feeding device for internal combustion engines comprising a plurality of fuel feeding pipes each having a valve for controlling the flow of fuel therethrough, means for simultaneously actuating said valves, said means comprising a rotatable member and rods each eccentrically connected at one end thereof to said member, each rod being connected to a valve at its other end, means for rotating said member, a slidable rod mounting said member, and means for moving said slidable rod to adjust the distance of the axis of rotation of said member from said valves.

**CHECK
YOUR FUEL
SUPPLY
AT A
GLANCE**



Write for Bulletin

THE LIQUIDOMETER CORP.

10-24 Skillman Ave., Long Beach City, Calif.

ENGINE
N. Y., assignor
ork, N. Y., a
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Serial No.



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INTERNAL
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Serial No.

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DIESEL VALVES have got to take it

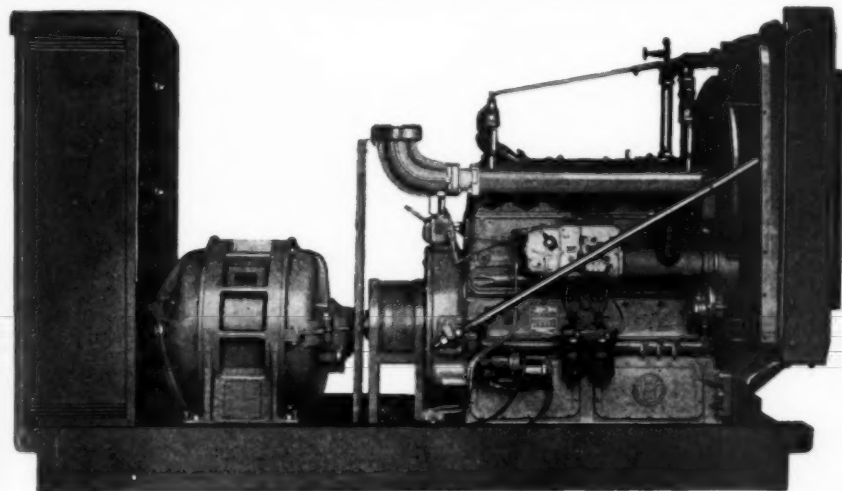
Below: Diesel type
ECCENTRIC Valve
Seat Grinder and
Wet Type Diesel
Valve Refacer.



In industrial, municipal, transportation, or fighter service, diesels are operating extra hours under extra loads . . . Valves and valve seats bear the brunt of all this . . . To keep valves performing with maximum efficiency longer, requires the finer precision and finish which the HALL ECCENTRIC Valve Seat Grinder and Wet Type Valve Refacer can give . . . Gets them back in service faster, too . . . Write us for complete information on the HALL Equipment pictured here and designed especially for servicing diesel valves and valve seats to factory standards of precision and finish.

The Hall Manufacturing Co., Toledo, Ohio, U.S.A.

HALL



ENGINE GENERATOR SETS

5 KW. TO 100 KW.

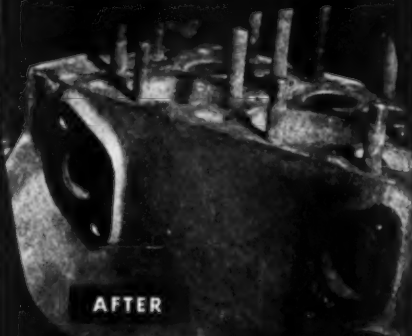
Duplex Truck Co.

Lansing, Michigan

Outside Freeze Crack



Permanently Repaired



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COLD WELDING

Guaranteed for the life of the motor

● Here's a typical example of what can be accomplished by K & W COLD WELDING . . . the modern way to repair cracked motor blocks and heads.

Most mechanics would throw up their hands at a job like this, yet K & W repaired it in about two hours.

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K & W GUARANTEES every job for the life of the motor, regardless of its type, size, age.

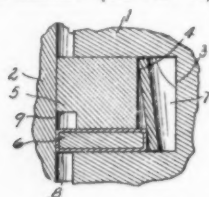
Follow the example of the hundreds of fleets, railroads, motor rebuilders, and mechanics the country over who are using this method.

Use K & W METALLIC SEAL (sold by jobbers on a money-back guarantee) to repair minor cracks. Use K & W COLD WELDING to repair the tough jobs. For complete details, consult your jobber, or write direct.

NOTE—Operators who maintain their own shops can obtain a license under K & W patents to handle their own repairs. Mechanics of licensees are trained by K & W without cost.


KERKLING
 AND COMPANY
 BLOOMINGTON, INDIANA
 West Coast Office and Repair Station
 6316 Selma Avenue, Hollywood 28, Calif.

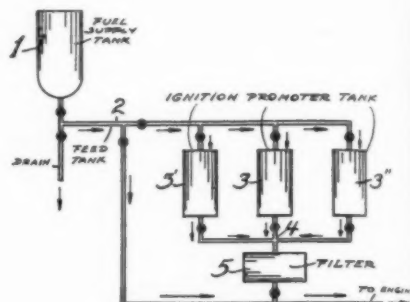
2,313,395
PISTON RING
 Harold P. Phillips, Hastings, Mich., assignor to
 Hastings Manufacturing Company, Hastings,
 Mich., a corporation of Michigan
 Application August 4, 1941, Serial No. 405,297
 4 Claims. (Cl. 309-44)



2. A piston ring assembly adapted for use in a piston ring groove other than the upper piston ring groove of an internal combustion engine, a piston ring assembly comprising a split expandable upper ring member, a thin split expandable lower ring member, and an expander acting on the lower ring member throughout the normal life thereof, said lower ring member having a peripheral and a side coating of non-corrodible lubricating metal whereby to deposit a coating of such metal on the cylinder wall from the peripheral surface during the initial stages of operation of the ring assembly, the side coating of the lower member being of the order of .0003 or over thereby providing a source of supply of non-corrodible lubricating

metal which is deposited on the cylinder wall at the cylinder contacting surface of the lower ring member is worn away following the wearing away of the coating on the cylinder contacting surface of the ring member during its initial operation, the upper member being without such coating metal.

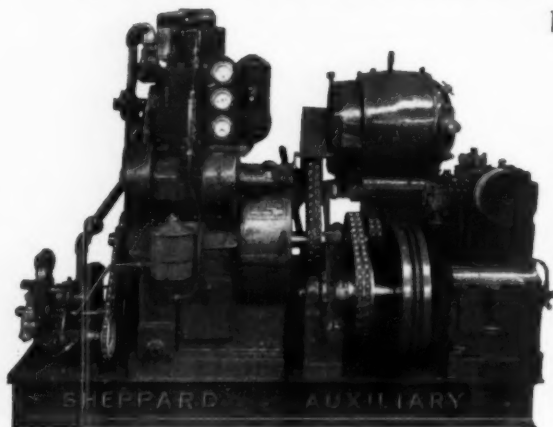
2,310,306
METHOD OF TREATING DIESEL FUELS
 Pharis Miller, Elizabeth, N. J., and Eugene Lieber, West New Brighton, Staten Island, N. Y., assignors to Standard Oil Development Company, a corporation of Delaware
 Application October 10, 1939, Serial No. 298,805
 5 Claims. (Cl. 44-57)



1. The method of treating a Diesel hydrocarbon fuel prior to ignition of the fuel in a compression-ignition engine of the Diesel type which comprises contacting a substantial portion of said fuel with solid free sulfur under suitable conditions and for a sufficient time to homogeneously admix with the fuel a substantial ignition quality improving amount of free sulfur, the admixed free sulfur being added in a proportion of at least a concentration of 0.02% by weight of the fuel just prior to the injection of the fuel into the combustion zone

DIESEL MARINE AUXILIARY UNITS

With Reserve Power



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 Sheppard Diesel Marine Auxiliary Units are designed and built to insure that extra power and stamina—always needed to meet the vicissitudes of weather—but doubly necessary in time of war. You can depend on Sheppard units to see your ship through again and again.

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Atlantic Seamless Flexible Metal Hose

Highly recommended by leading Diesel Engine Manufacturers, Naval Architects and Engineers for

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Absorbs vibration. Can't leak or burn out. No joints to loosen. No packing to rely on for tightness. In sizes 1" to 36" I.D., inclusive. With forged steel flanges or applied in lengths desired, straight or bent to your specifications. Atlantic Hose is widely used in Industrial Plants, on Railroads, in Marine service and by the United States Navy.



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CLARIFIER COMPANY

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240-264 H.P., Fairbanks-Morse, Model VA32, factory reconditioned recently, equipped with single stage combustion heads and needle type wrist pin bearings, direct connected to 200 KVA, 2300 volt, 3 phase, 60 cycle, 257 speed, generator with direct connected exciter, switchboard and air starting equipment. Immediate Delivery.

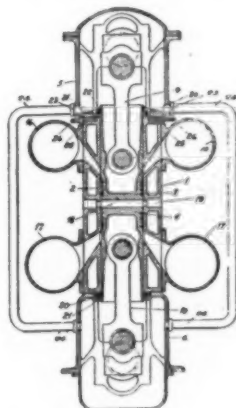
Also have several sizes Diesel engines with or without generators, Stock Sumter. Large stock electric motors, belted generators, ammonia compressors.

Sumter Electric Rewinding Co.,
Sumter, S. C.

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Serving The United Nations
STEELBESTOS • TWIN-TYPE STEELBESTOS • KORKOID
SPRINGOID • DELOID • SYNTHETIC COMPOSITIONS
Detroit Gasket & Mfg. Company • Detroit

**SAFETY CONTROLS
ALARM SYSTEMS
TACHOMETERS
FOR DIESEL ENGINES**
VIKING INSTRUMENTS, INC.
Stamford, Connecticut

2,314,670
INTERNAL COMBUSTION ENGINE
Edvin Ossian Parcival Thege, Stockholm, Sweden, assignor to Aktiebolaget Atlas Diesel, Stockholm, Sweden
Application February 21, 1941, Serial No. 379,947
In Sweden March 21, 1940
14 Claims. (Cl. 123-51)

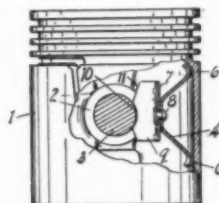


5. An internal combustion engine, comprising a substantially vertically mounted cylinder, a trunk piston movable in said cylinder, piston rings at the lower part of said piston, a crank casing at the top of said cylinder, a crank shaft mounted in said crank casing and in operative connection with said piston, a packing-box at the upper end of said cylinder, and a packing-box in the cylinder at a place below the upper end thereof, the piston motion being so made with respect to the length of stroke and the diameter and the length of the piston that the latter always, even in its lower end position, projects above the cylinder and has its overflow in permanent communication with an outlet.

2,313,396

PISTON EXPANDER

Harold P. Phillips, Hastings, Mich., assignor to Hastings Manufacturing Company, Hastings, Mich.
Application March 2, 1942, Serial No. 432,987
3 Claims. (Cl. 309-12)



FOR SALE

ONE NEW DELAVAL OIL PURIFIER

complete with independent motor driven pump. Capacity 600 G.P.H. on Light Diesel Fuel Oil or Lubricating Oil. Motors 220 volts DC. Address: Box 137, DIESEL PROGRESS, 2 W. 45th St., New York City.

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Pierce Governors

Standard Equipment on the world's leading Diesel Engines!

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★ More than a quarter century of specialized heat transfer experience—that's the heritage of every YOUNG product. Whatever your engine cooling problems may be—let YOUNG engineering research and manufacturing facilities solve them practically and economically. YOUNG offers a complete line of Oil Coolers. Radiators for Diesel, Gas and Gasoline Engines • Intercoolers • Heat Exchangers • Engine Jacket Water Coolers • Aircraft Heat Transfer Units • Unit Heaters • Convectors • Condensers • Evaporators • Air Conditioning Units • Heating and Cooling Coils.

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SPECIALIZING IN HEAT TRANSFER PRODUCTS



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EMPIRE Meters of all sizes are furnished with special flanges integral with meter casing for shipboard use. EMPIRE Shipboard Meters are approved for use in the United States Navy by the Bureau of Engineering, Washington, D. C., and comply fully with the requirements of the U. S. Bureau of Marine Inspection and Navigation, American Bureau of Shipping, and Lloyd's Register of Shipping. The long-wearing EMPIRE Meter is especially suited to marine installation because of its exceptional ability to maintain its accuracy for long periods without adjustment or repairs. Write for Bulletin N-828.

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BALL, ROLLER and THRUST

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Remember us then.

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LARGEST BUILDER OF SMALL DIESELS
KANSAS CITY, MO., U. S. A.

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GENERATORS
A. C. and D. C.

Columbia A.C. and D.C. Generators are built to meet highest performance standards. Complete range of application, including light, power, ship auxiliaries, or custom designed units. Available in single bearing type for direct connection to engines. Write for information.

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2,315,114
DIESEL ENGINE
William Fels, Fairhope, Ala., assignor to F-S-K Manufacturing Company, Inc., Foley, Ala., a corporation of Alabama
Application June 1, 1936, Serial No. 82,956
8 Claims. (Cl. 74-40)



1. In a high compression internal combustion engine of the Diesel type, a cylinder having a piston reciprocable therein, a conventional connecting rod for said piston, a crankshaft having a throw independent of the stroke of the piston, a rocker fulcrumed on an axis intersecting the extended axis of the cylinder at right angles, the end of the connecting rod being pivoted to said rocker, the rod and rocker lengths being such that these parts are in substantial alignment at top piston position to apply the initial force of the explosion substantially solely to the said fulcrum, and a second connecting rod having a pivot to said rocker coaxial with that of the first connecting rod and having its opposite end mounted on the crank throw, said crankshaft axis being spaced a substantial distance laterally of the cylinder axis.

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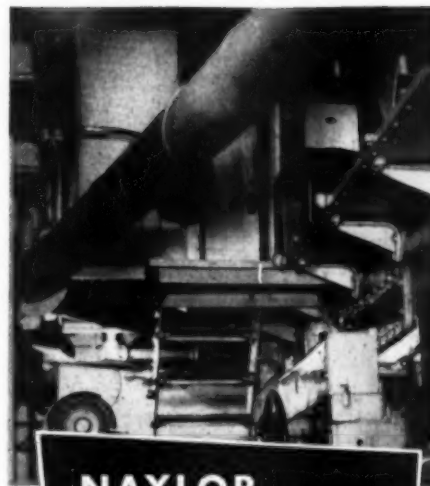
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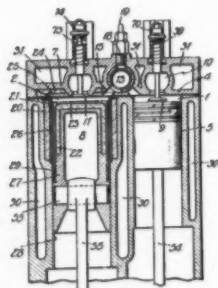
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2,315,011
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Francisco Angel Quiroz, Newark, N. J.
Application November 12, 1940, Serial No.
365,189
4 Claims. (Cl. 123-68)



1. In an internal combustion engine, a cylinder and piston forming a compression chamber, a cylinder and piston forming an expansion chamber having a greater maximum capacity than said compression chamber, a channel interconnecting said chambers comprising an ignition chamber, an intake valve in said compression chamber, an exhaust valve in said expansion chamber, valve means controlling said channel so as to close said ignition chamber from said expansion chamber while admitting a charge to said ignition chamber from said compression chamber during a compression stroke of the compressor piston thereof, and to close said ignition chamber from said compression chamber while releasing a charge from said ignition chamber into said expansion chamber during an expansion stroke of the piston thereof, means mechanically connecting said pistons so that an expansion stroke of said expansion chamber piston follows directly after a compression stroke of said compression chamber piston, means forming water jacket cavities around the walls of said compression chamber cylinder, said compression chamber piston being designed to provide good heat conduction from the entire surface of the head of said piston to the walls of said compression chamber cylinder, and the piston and cylinder walls of said expansion chamber comprising metallic surface parts constituting the boundaries of the expansion chamber, backed by insulation over a major part of their area.

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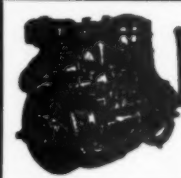
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